Preface: A digital start to the day... ("lst person ethnography")

Google - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

Address http://www.google.com/ig?hl=en Go Links 19.3 minutes saved

Google Search 4 blocked Check AutoLink AutoFill Options

Earthquake Watch

edit

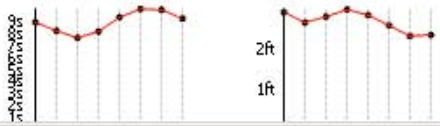
2.7 Andreanof Islands, Aleutian Islands, Alaska
June 07, 2006 14:43:59 GMT More (Latest)

Global Surfari

edit

Surf Forecast for USA California (S)

Date	Wave Ht	Wave Period	Wind Spd	Wind Dir
6/6	3.09	8.86	16.62	SE
7/6	3.35	8.15	18.39	SE
8/6	3.2	7.56	18.6	SE
9/6	2.98	8.07	16.04	SE
10/6	2.84	9.28	13.53	SE
11/6	2.58	10.02	10.12	ESE
12/6	2.31	10.09	10.45	ENE
13/6	2.34	9.17	14.9	ENE

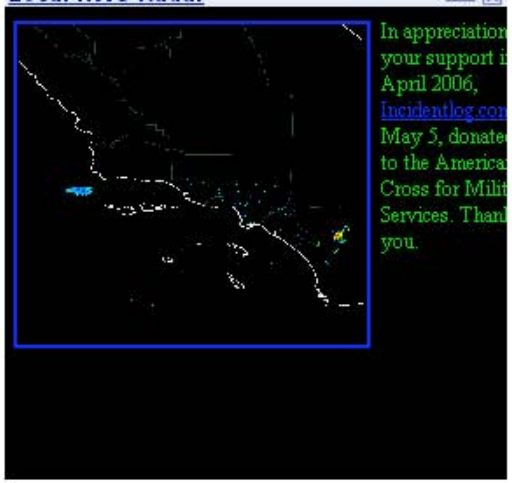


Date & Time

edit

Local NWS Radar

edit



In appreciation your support i April 2006, Incidentlog.co May 5, donate to the America Cross for Milit Services. Than you.

Weather

edit

Los Angeles, CA
68°F
Overcast

Today Thu Fri

Nasa Image of the Day

edit

« Like a butterfly, a white dwarf star begins its life »

SiliconBeat

edit

Google Spreadsheets, one more reason not to pay for Microsoft Office

Avvo, a new legal services start-up

Tuesday essentials: Pure Digital, Friendster CEOs & other fundings

WSJ.com: What's News Technology

edit

Dell Recruits Google to Resell Servers

Tech Shares Inch Back Up

Hynix Creditors Plan Share Sale

WSJ.com: Personal Technology

edit

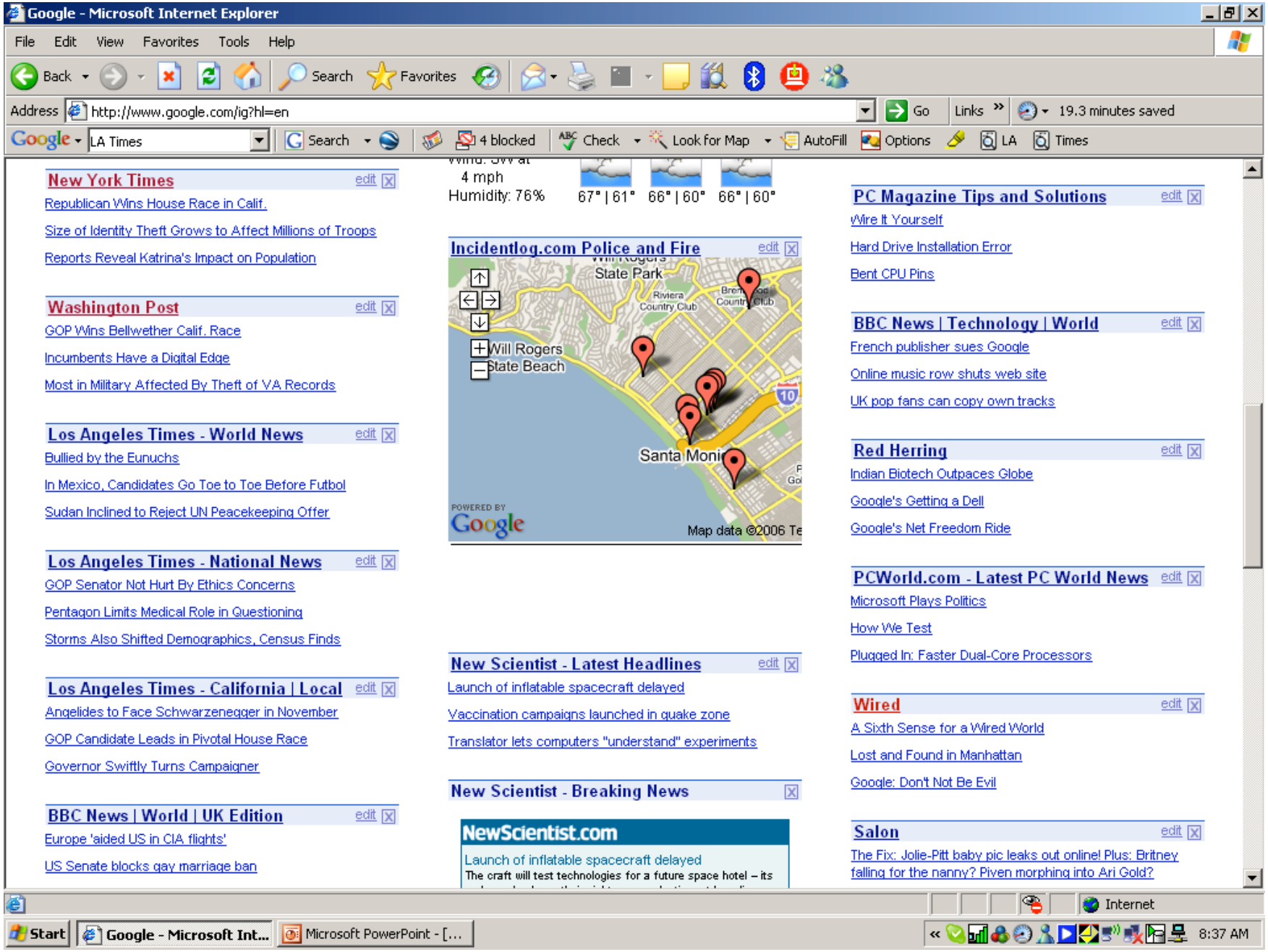
Smartphones Get Smarter

Prepaid Global Calling Plans Have Glitches

Companies Push Advances in Camera Phones

Internet

Start Google - Microsoft Int... 8:31 AM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New York Times edit
Republican Wins House Race in Calif.
Size of Identity Theft Grows to Affect Millions of Troops
Reports Reveal Katrina's Impact on Population
Washington Post edit
GOP Wins Bellwether Calif. Race
Incumbents Have a Digital Edge
Most in Military Affected By Theft of VA Records
Los Angeles Times - World News edit
Bullied by the Eunuchs
In Mexico, Candidates Go Toe to Toe Before Futbol
Sudan Inclined to Reject UN Peacekeeping Offer
Los Angeles Times - National News edit
GOP Senator Not Hurt By Ethics Concerns
Pentagon Limits Medical Role in Questioning
Storms Also Shifted Demographics, Census Finds
Los Angeles Times - California | Local edit
Angelides to Face Schwarzenegger in November
GOP Candidate Leads in Pivotal House Race
Governor Swiftly Turns Campaigner
BBC News | World | UK Edition edit
Europe 'aided US in CIA flights'
US Senate blocks gay marriage ban
Incidentlog.com Police and Fire edit
State Park
Riviera Country Club
Will Rogers State Beach
Santa Moni
POWERED BY Google
Map data ©2006 Te
New Scientist - Latest Headlines edit
Launch of inflatable spacecraft delayed
Vaccination campaigns launched in quake zone
Translator lets computers "understand" experiments
New Scientist - Breaking News
NewScientist.com
Launch of inflatable spacecraft delayed
The craft will test technologies for a future space hotel – its
PC Magazine Tips and Solutions edit
Wire It Yourself
Hard Drive Installation Error
Bent CPU Pins
BBC News | Technology | World edit
French publisher sues Google
Online music row shuts web site
UK pop fans can copy own tracks
Red Herring edit
Indian Biotech Outpaces Globe
Google's Getting a Dell
Google's Net Freedom Ride
PCWorld.com - Latest PC World News edit
Microsoft Plays Politics
How We Test
Plugged In: Faster Dual-Core Processors
Wired edit
A Sixth Sense for a Wired World
Lost and Found in Manhattan
Google: Don't Not Be Evil
Salon edit
The Fix: Jolie-Pitt baby pic leaks out online! Plus: Britney falling for the nanny? Piven morphing into Ari Gold?
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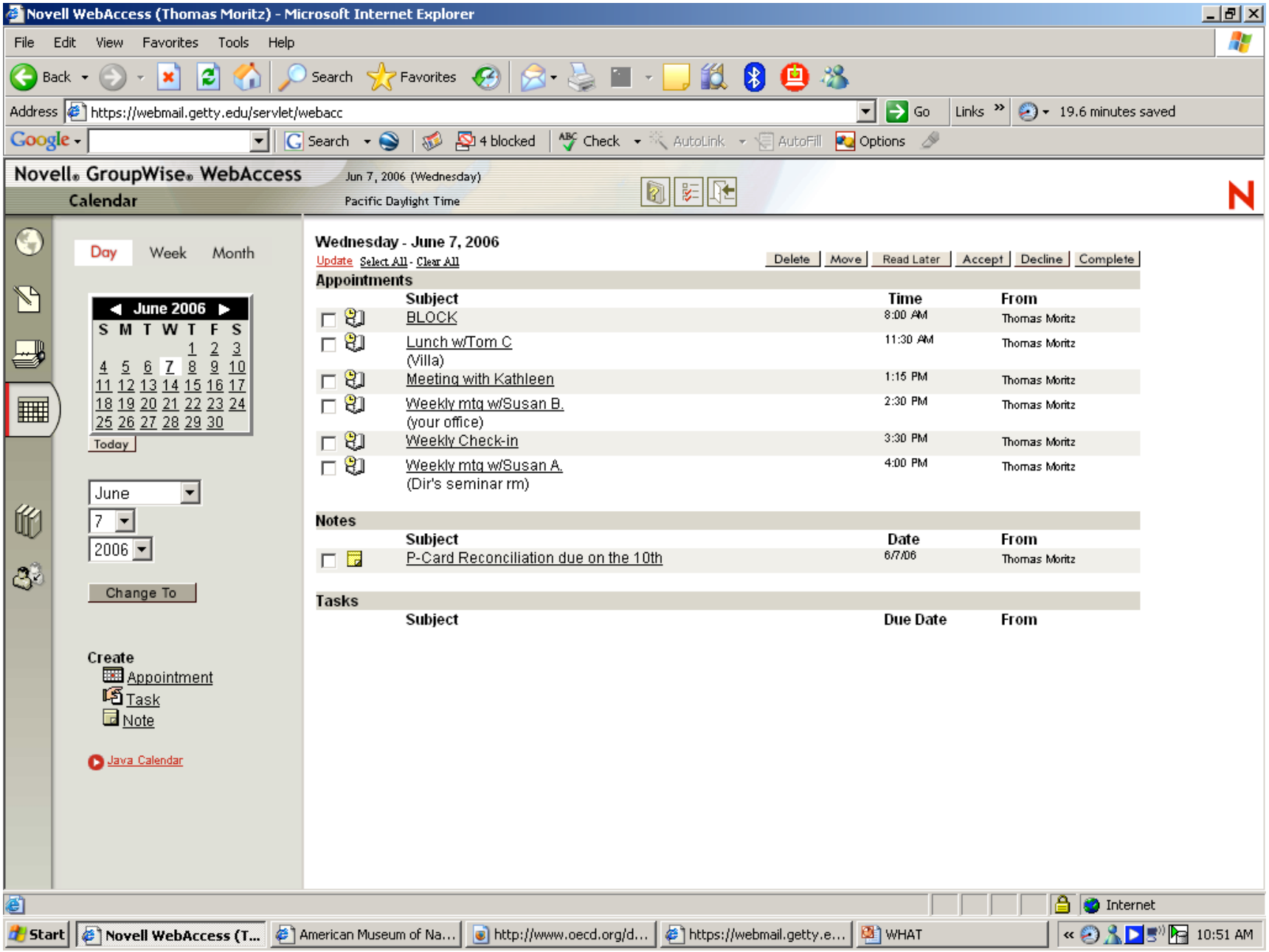
8:37 AM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Novell® GroupWise® WebAccess
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Java Calendar
Wednesday - June 7, 2006
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Lunch w/Tom C (Villa) 11:30 AM Thomas Moritz
Meeting with Kathleen 1:15 PM Thomas Moritz
Weekly mtg w/Susan B. (your office) 2:30 PM Thomas Moritz
Weekly Check-in 3:30 PM Thomas Moritz
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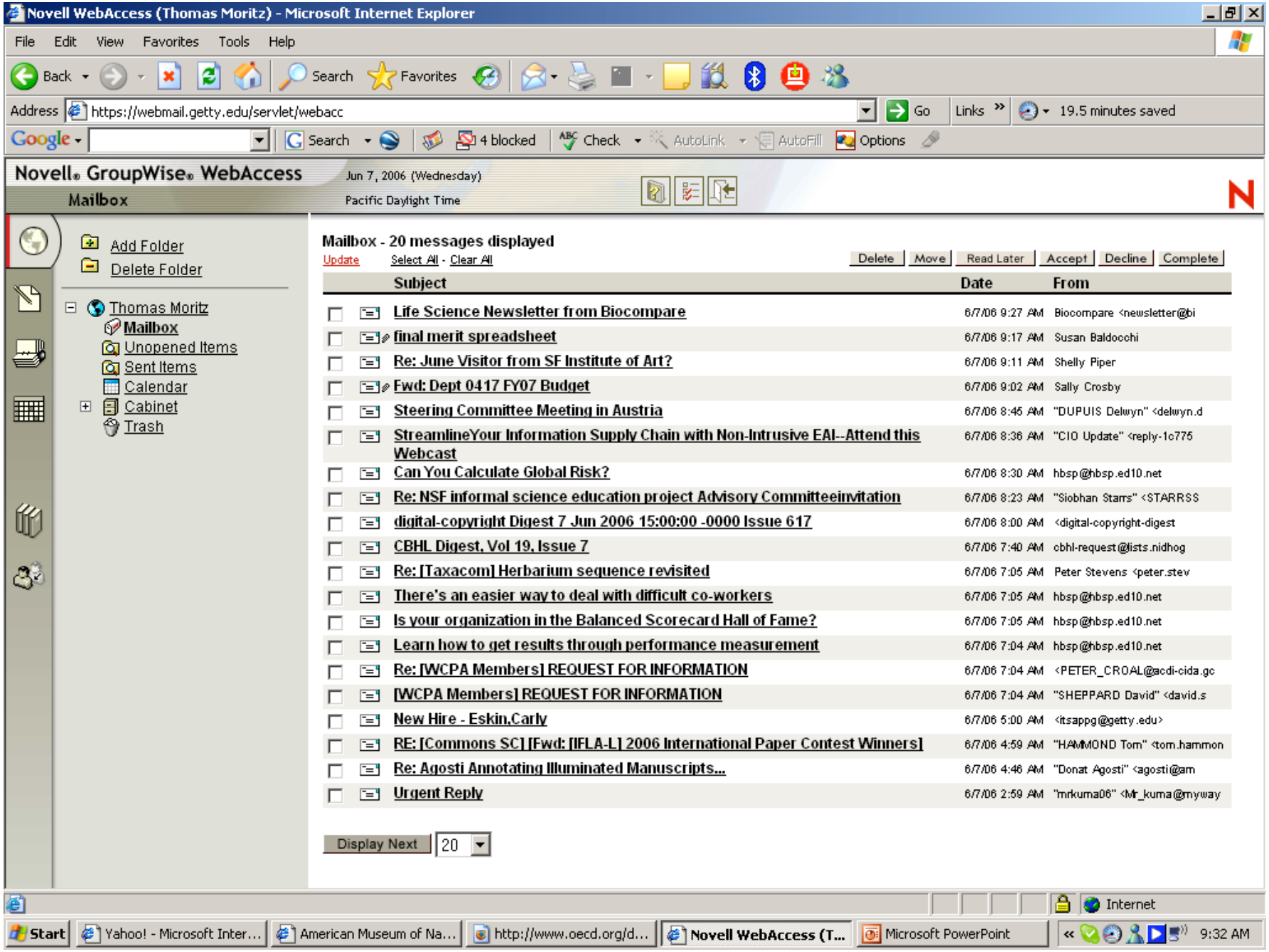
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Jun 7, 2006 (Wednesday)
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Mailbox
Unopened Items
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Subject Date From
Life Science Newsletter from Biocompare 6/7/06 9:27 AM Biocompare <newsletter@bi
final merit spreadsheet 6/7/06 9:17 AM Susan Baldocchi
Re: June Visitor from SF Institute of Art? 6/7/06 9:11 AM Shelly Piper
Fwd: Dept 0417 FY07 Budget 6/7/06 9:02 AM Sally Crosby
Steering Committee Meeting in Austria 6/7/06 8:46 AM "DUPUIS Delwyn" <delwyn.d
StreamlineYour Information Supply Chain with Non-Intrusive EAI--Attend this Webcast 6/7/06 8:36 AM "CIO Update" <reply-1c775
Can You Calculate Global Risk? 6/7/06 8:30 AM hbsp@hbsp.ed10.net
Re: NSF informal science education project Advisory Committeeinvitation 6/7/06 8:23 AM "Siobhan Starrs" <STARRSS
digital-copyright Digest 7 Jun 2006 15:00:00 -0000 Issue 617 6/7/06 8:00 AM <digital-copyright-digest
CBHL Digest, Vol 19, Issue 7 6/7/06 7:40 AM cbhl-request@lists.nidhog
Re: [Taxacom] Herbarium sequence revisited 6/7/06 7:05 AM Peter Stevens <peter.stev
There's an easier way to deal with difficult co-workers 6/7/06 7:05 AM hbsp@hbsp.ed10.net
Is your organization in the Balanced Scorecard Hall of Fame? 6/7/06 7:05 AM hbsp@hbsp.ed10.net
Learn how to get results through performance measurement 6/7/06 7:04 AM hbsp@hbsp.ed10.net
Re: [WCPA Members] REQUEST FOR INFORMATION 6/7/06 7:04 AM <PETER_CROAL@acdi-cida.gc
[WCPA Members] REQUEST FOR INFORMATION 6/7/06 7:04 AM "SHEPPARD David" <david.s
New Hire - Eskin,Carly 6/7/06 5:00 AM <itsappg@getty.edu>
RE: [Commons SC] [Fwd: [IFLA-L] 2006 International Paper Contest Winners] 6/7/06 4:59 AM "HAMMOND Tom" <tom.hammon
Re: Agosti Annotating Illuminated Manuscripts... 6/7/06 4:46 AM "Donat Agosti" <agosti@am
Urgent Reply 6/7/06 2:59 AM "mrkuma06" <Mr_kuma@myway
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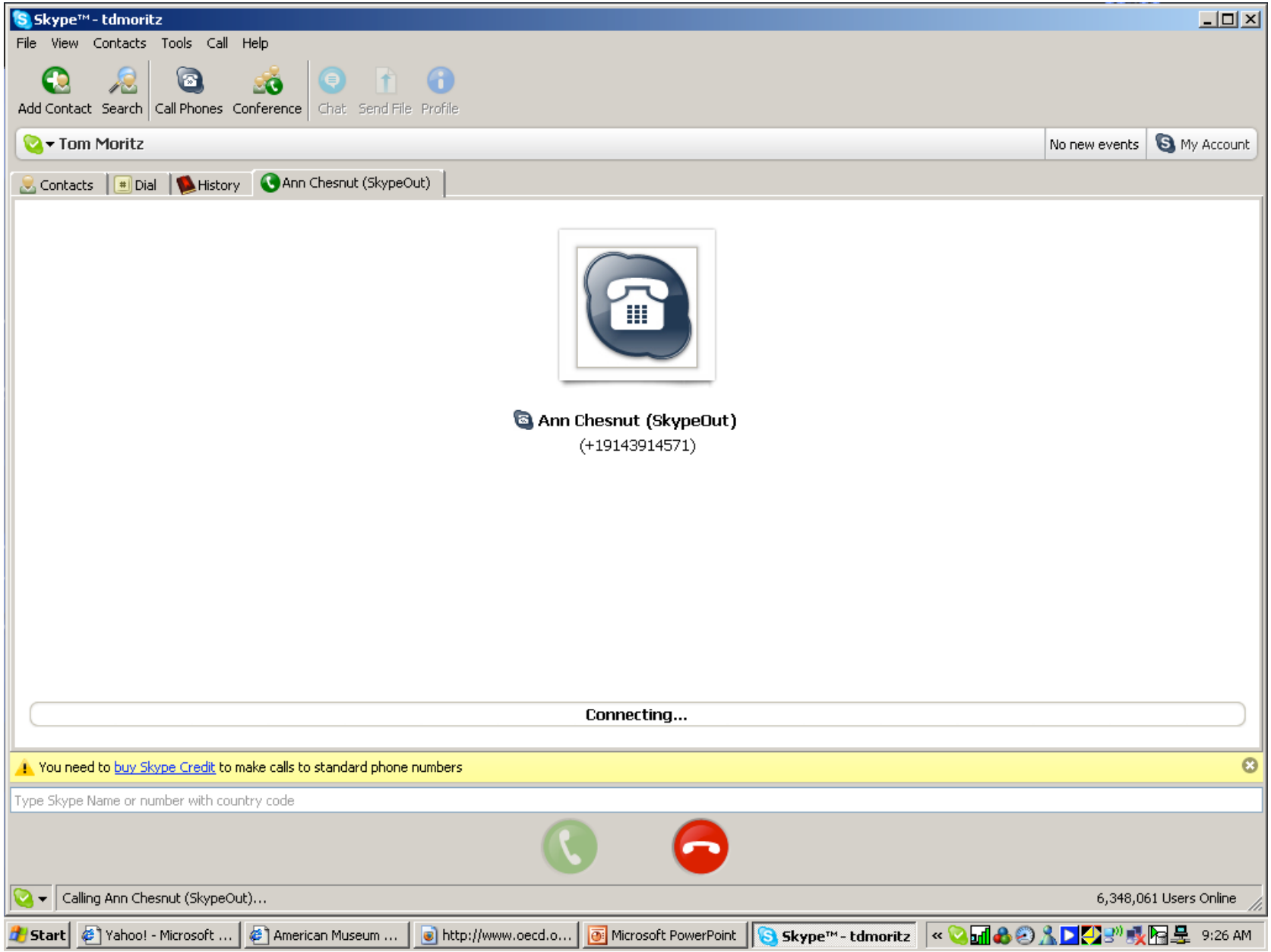
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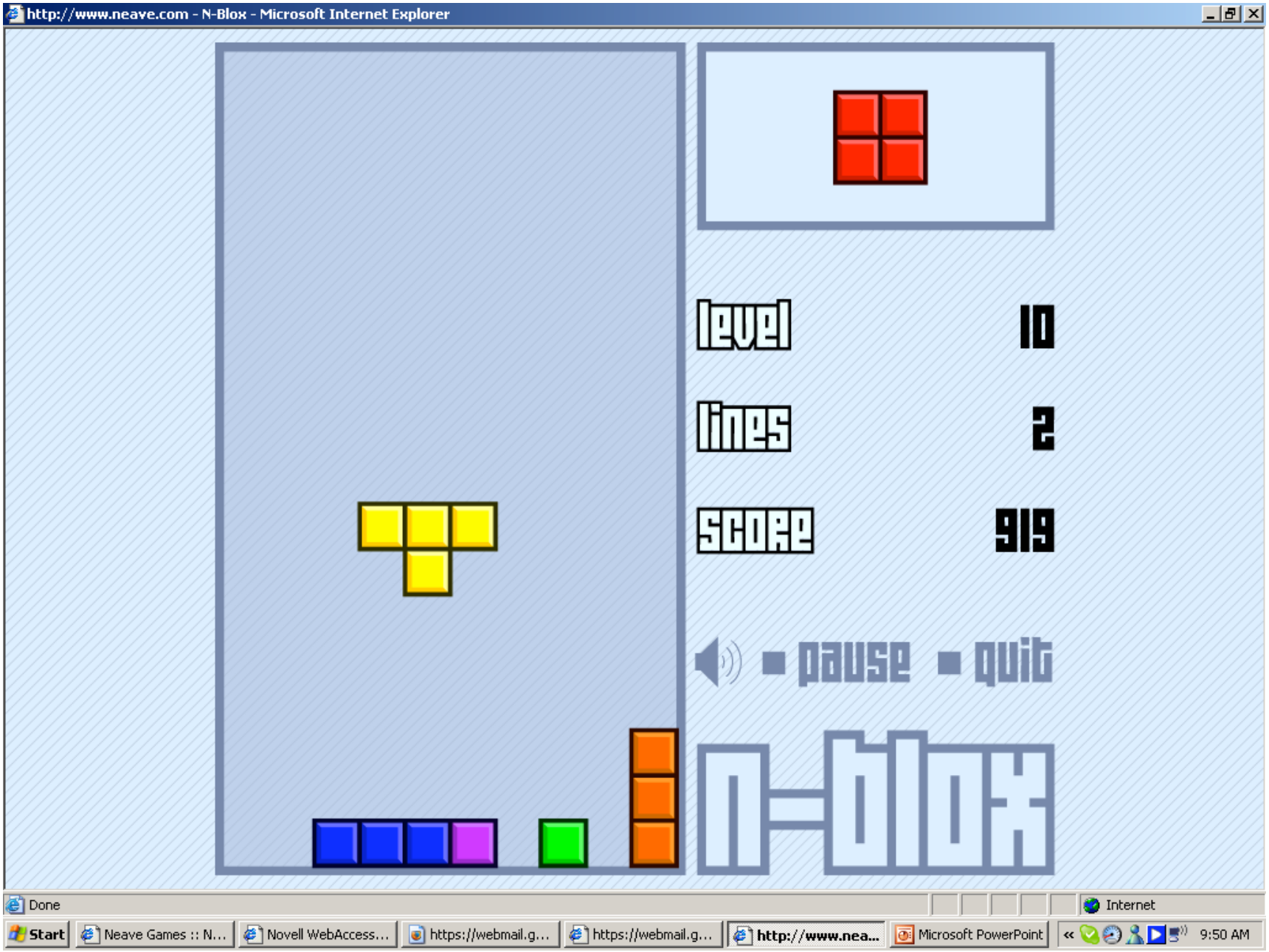
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Cashless Society
Johannesburg

Convergent Technologies / Emergent Opportunities?

Art History and the Digital World
Getty Research Institute
June 8-9, 2006

The Getty Research Institute:
Mission Statement

"The Getty Research Institute exists to bring together all the resources and activities required to advance the understanding of the visual arts taken in their widest possible significance."

-- Tom Crow
Director
Getty Research Institute

The Getty Research Institute as an optimal "Knowledge Environment"?

- Scholarship
- Publishing
- Programs and Exhibits
- Research Databases and Indexing Resources
- Library
- Special Collections
- Archives
- Digital Research and Development

"Institutions that cannot respond to new knowledge quickly and flexibly, with new organizational and administrative configurations, are—at least in the sciences—trumped in the production of new discoveries (and Nobel Laureates!) by those that can…"

Billy E. Frye, "Introduction", IN ***The Humanities and The Sciences*** , **American Council of Learned Societies Occasional Paper *No. 47*, 1999.**
http://www.acls.org/op47-3.htm#galison (MAY 31, 2006)

"***Scholars who fail to see their fields of inquiry through the eyes of others*** not only limit their own vision; they also run the risk of entering an intellectual *cul de sac,* or worse, slipping unconsciously from the search for understanding into a defense of dogma and fashion.

"***Interaction across the disciplines is one of the strongest stimulants of creative scholarship…"***

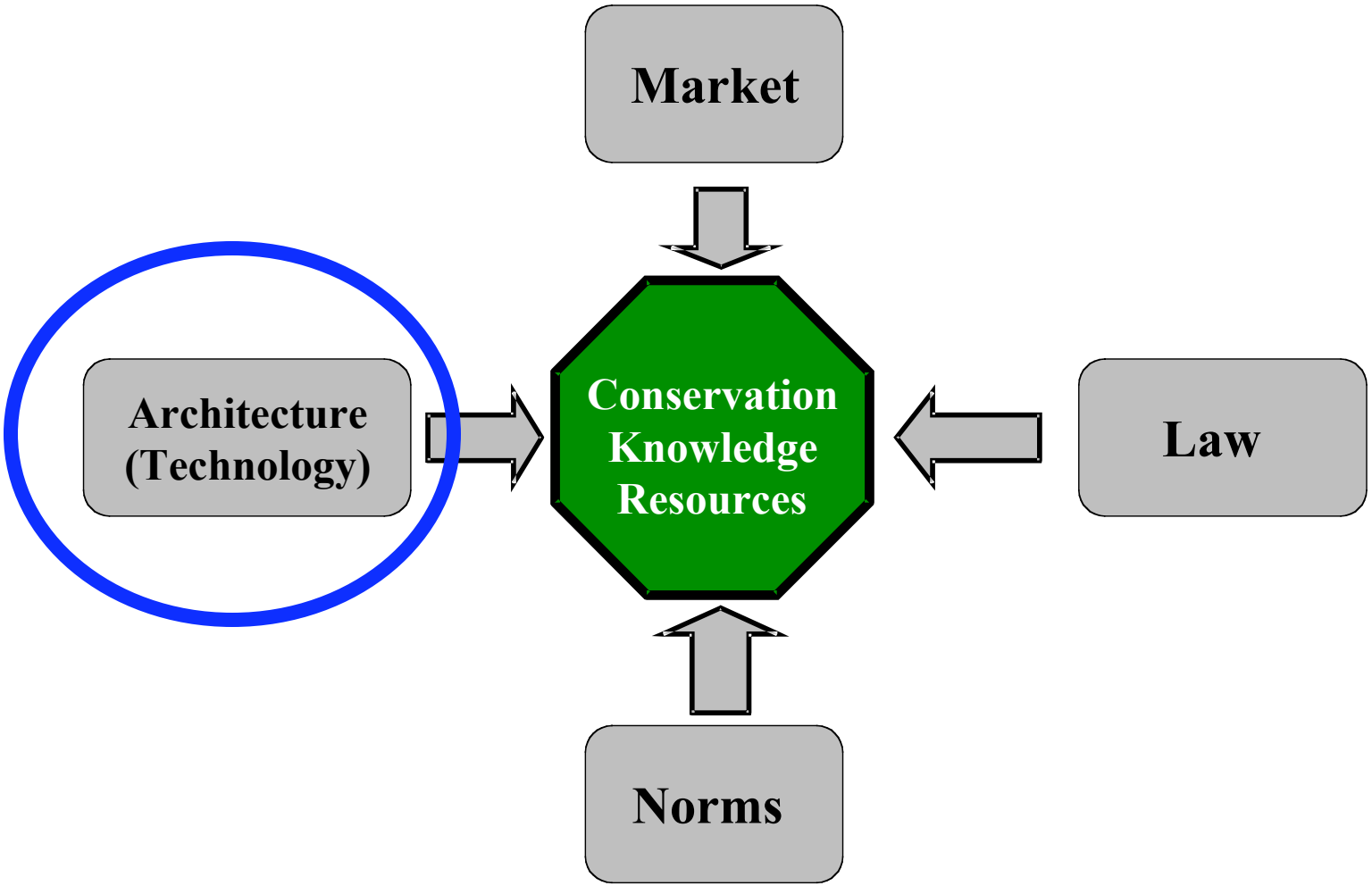
Billy E. Frye, "Introduction", ***IN The Humanities and The Sciences*** , ***American Council of Learned Societies Occasional Paper No. 47*****, 1999.** http://www.acls.org/op47-3.htm#galison **(MAY 31, 2006)**

"Finally, any nation that **attempts to address the urgent social problems of our time *solely* from a scientific or a humanistic vantage point will surely fail** to find solutions that take account of the essential and inescapable interconnections and inter-dependencies among the different elements of our natural and social worlds.

"Our failure to make these connections is, I suspect, the source of much of the public's unfortunate image of university faculty as a privileged priesthood pursuing their own esoteric interests at public expense."

Billy E. Frye, "Introduction", ***IN The Humanities and The Sciences*** , ***American Council of Learned Societies Occasional Paper No. 47*****, 1999.** http://www.acls.org/op47-3.htm#galison **(MAY 31, 2006)**

"Modalities of Constraint" on Access



Adapted from: Lessig, L. ***Code and other laws of cyberspace. NY, Basic Books, 1999.***

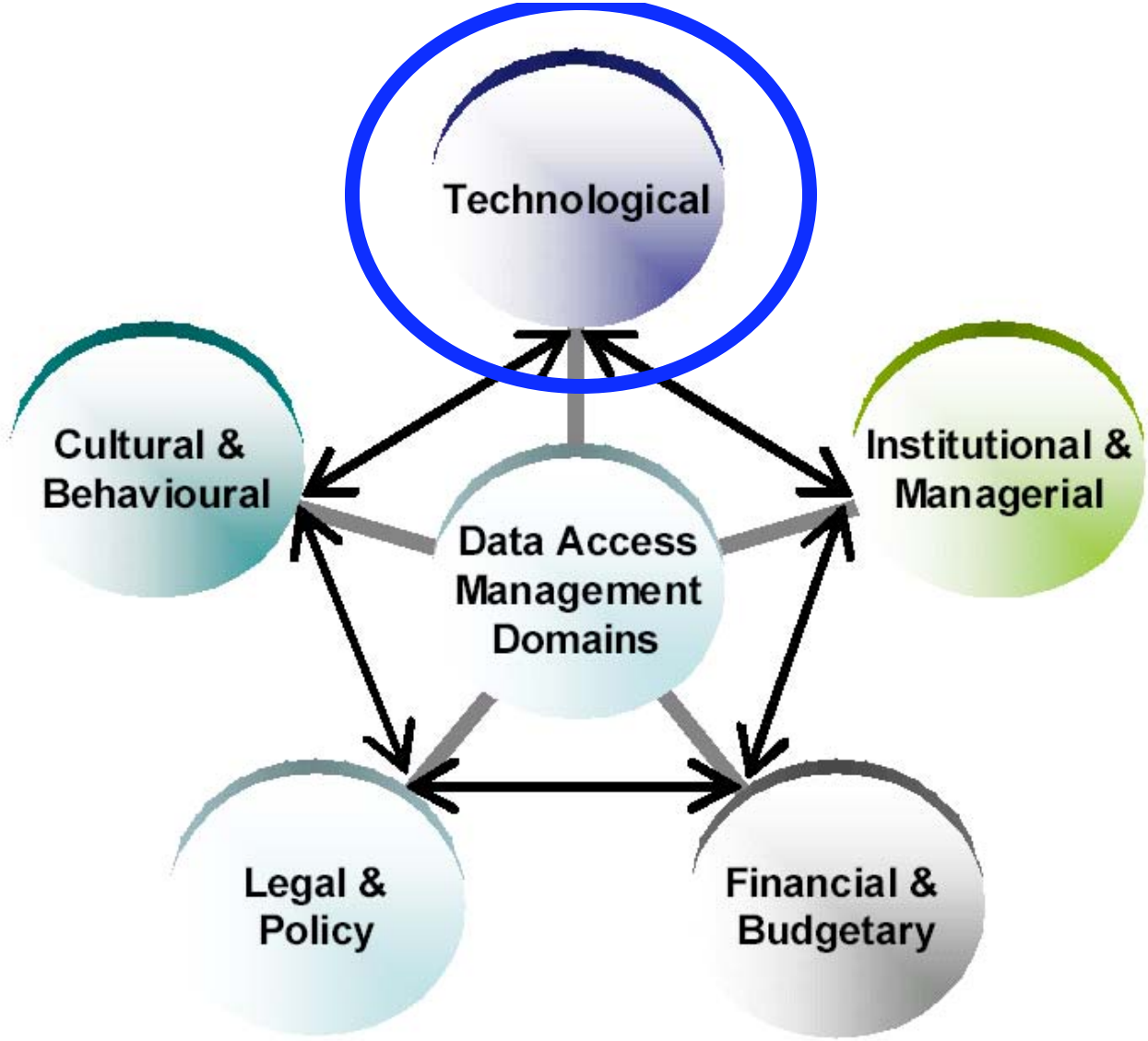


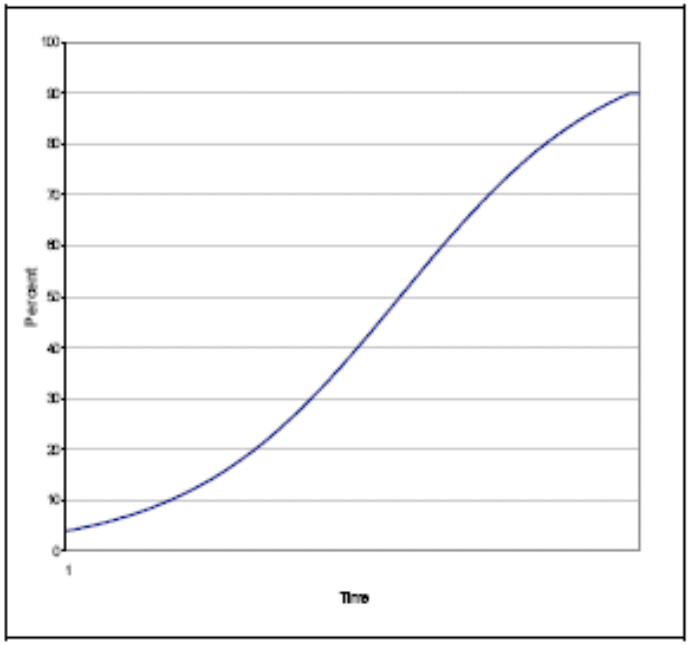
Figure 1. Components of a Data Access Regime

OECD Follow Up Group on Issues of Access to Publicly Funded Research Data. *Promoting Access to Public Research Data for Scientific,Economic, and Social Development: Final Report* March 2003

Adoption of new technologies: “S curve”

The pattern exhibited thus far by household access to both computers and the Internet accords with the “S-curve” pattern typically observed in the adoption of new technologies. Historically, when a new technology is first introduced, the number of users expands rapidly but from a low base. Over time, as a group reaches the middle range of the S-curve, the growth rate tends to slow while the point change continues to increase. Once the penetration nears its saturation point (at the higher end of the S-curve), both the percentage point change and the expansion rate begin to decrease.

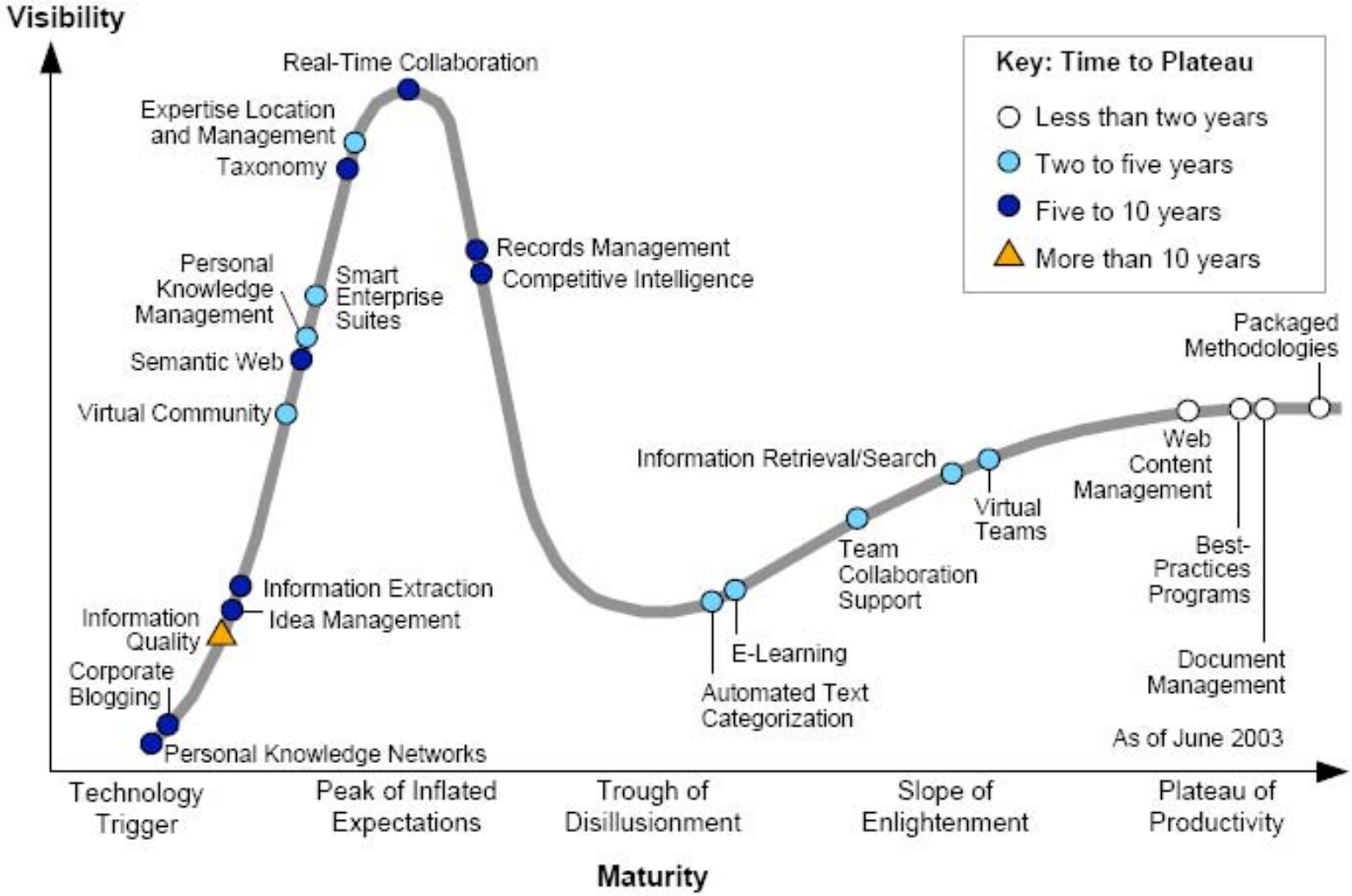
Figure I-2
An Illustrative S Curve



***FALLING THROUGH THE NET: TOWARD DIGITAL INCLUSION A Report on Americans’ Access to Technology Tools*.** U.S. Department of Commerce Economic and Statistics Administration and National Telecommunications and Information Administration **October 2000**

Hype Cycle for Knowledge Management, 2003

1.0 The Hype Cycle



Source: Gartner Research (June 2003)

Figure 1. Hype Cycle for Knowledge Management, 2003

A Brief Ethical Digression…

THE SECOND ENCLOSURE MOVEMENT AND THE CONSTRUCTION OF THE PUBLIC DOMAIN

JAMES BOYLE*

The law locks up the man or woman
Who steals the goose from off the common
But leaves the greater villain loose
Who steals the common from off the goose.

The law [illegible]
When we take things we do not own
But leaves the lords and ladies fine
Who take things that are yours and mine.

The poor and wretched don't escape
If they conspire the law to break;
This must be so but they endure
Those who conspire to make the law.

The law locks up the man or woman
Who steals the goose from off the common
And geese will still a common lack
Till they go and steal it back.

Anonymous

PART ONE: ENCLOSURE

I

THE FIRST ENCLOSURE MOVEMENT

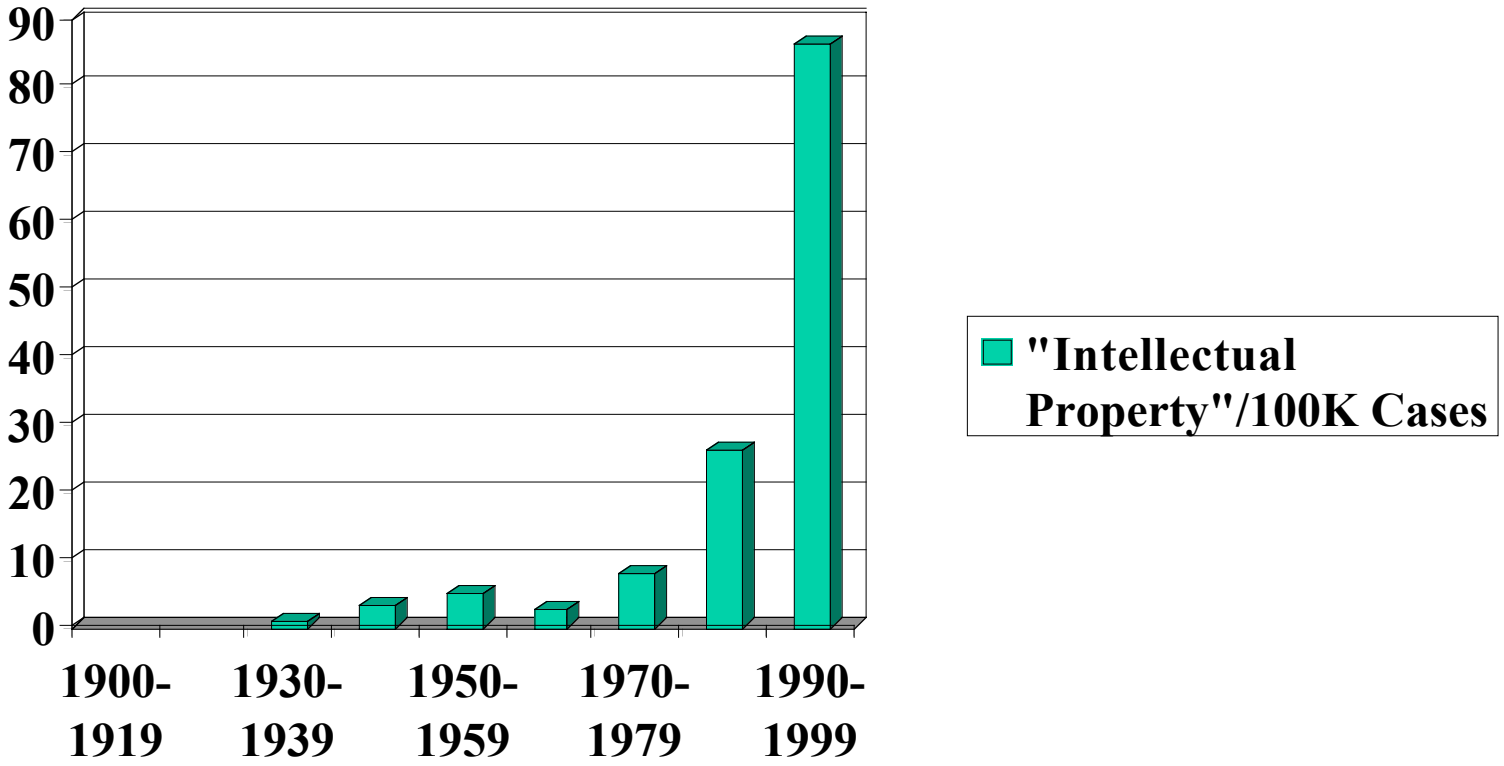
This poem[1] is one of the pithiest condemnations of the English enclosure movement, the process of fencing off common land and turning it into private

---

* Professor of Law, Duke University.

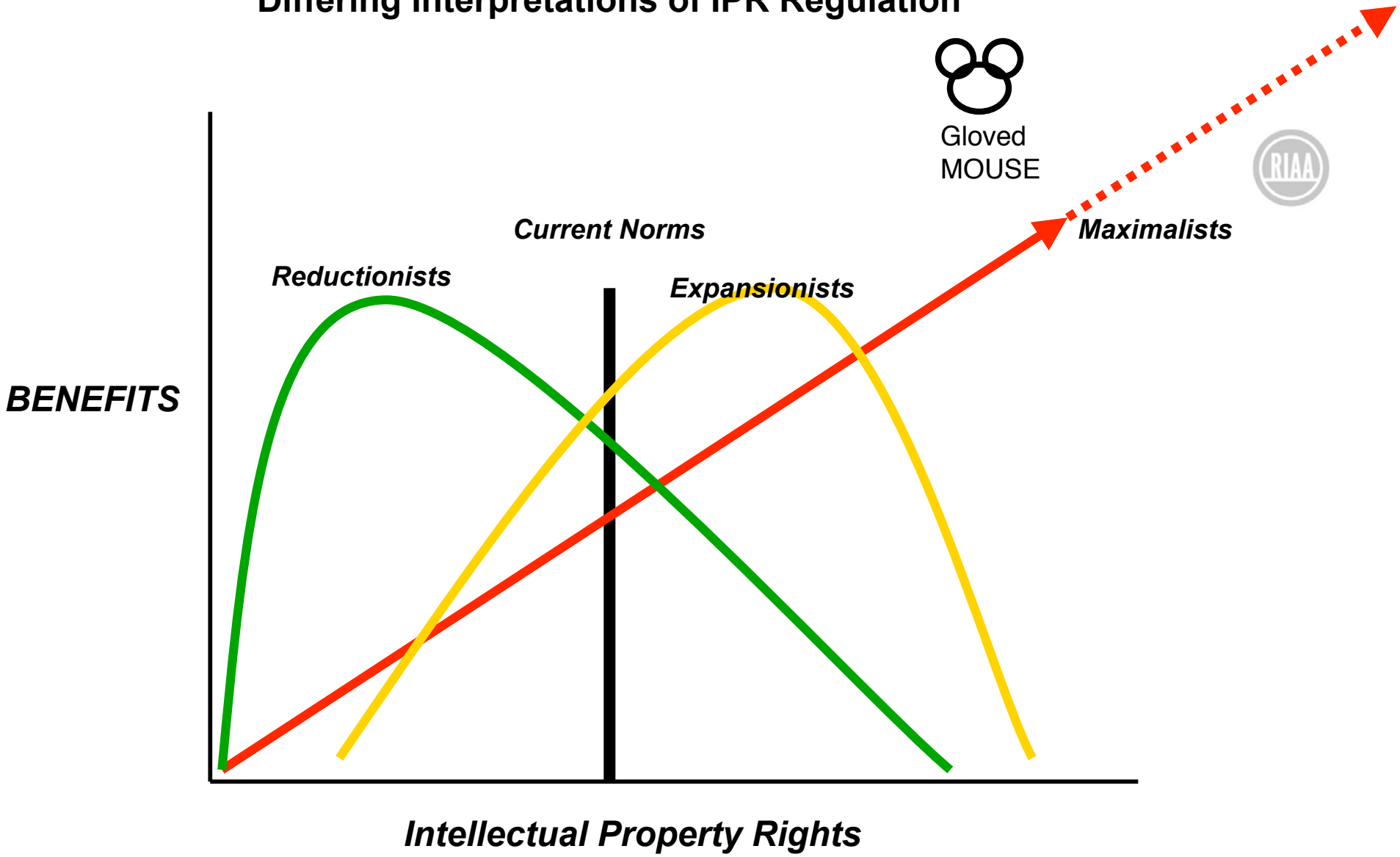
An earlier and considerably shorter version of this article appeared as *Fencing off Ideas*, DAEDALUS, Spring 2002, at 13. I wish to thank Yochai Benkler and Larry Lessig for comments, and Matt Jones, Greg Manter, and Victoria Von Portatius for their research.

Occurrences of the phrase “intellectual property” per 100,000 U.S. Federal Cases



“Professor Hank Greely” Cited in Lessig, L. The future of ideas: the fate of the commons in a connrcted world. NY, Random House, 2001. P. 294.

Differing Interpretations of IPR Regulation



Testimony of *Federal Reserve Board* Chairman Alan Greenspan
Semiannual Monetary Policy Report to the US Congress
Before the Committee on Banking,Housing, and Urban Affairs,U.S. Senate July 16, 2002

"Why did corporate governance checks and balances that served us reasonably well in the past break down? At root was the rapid enlargement of stock market capitalizations in the latter part of the 1990s that arguably ***engendered an outsized increase in opportunities for avarice***. ***An infectious greed seemed to grip much of our business community.*** Our historical guardians of financial information were overwhelmed. Too many corporate executives sought ways to "harvest" some of those stock market gains. As a result, the highly desirable spread of shareholding and options among business managers perversely created incentives to artificially inflate reported earnings in order to keep stock prices high and rising. This outcome suggests that the options were poorly structured, and, consequently, they failed to properly align the long-term interests of shareholders and managers, the paradigm so essential for effective corporate governance. The incentives they created overcame the good judgment of too many corporate managers. ***It is not that humans have become any more greedy than in generations past. It is that the avenues to express greed had grown so enormously***. "

http://www.federalreserve.gov/boarddocs/hh/2002/july/testimony.htm

Universal Declaration of Human Rights

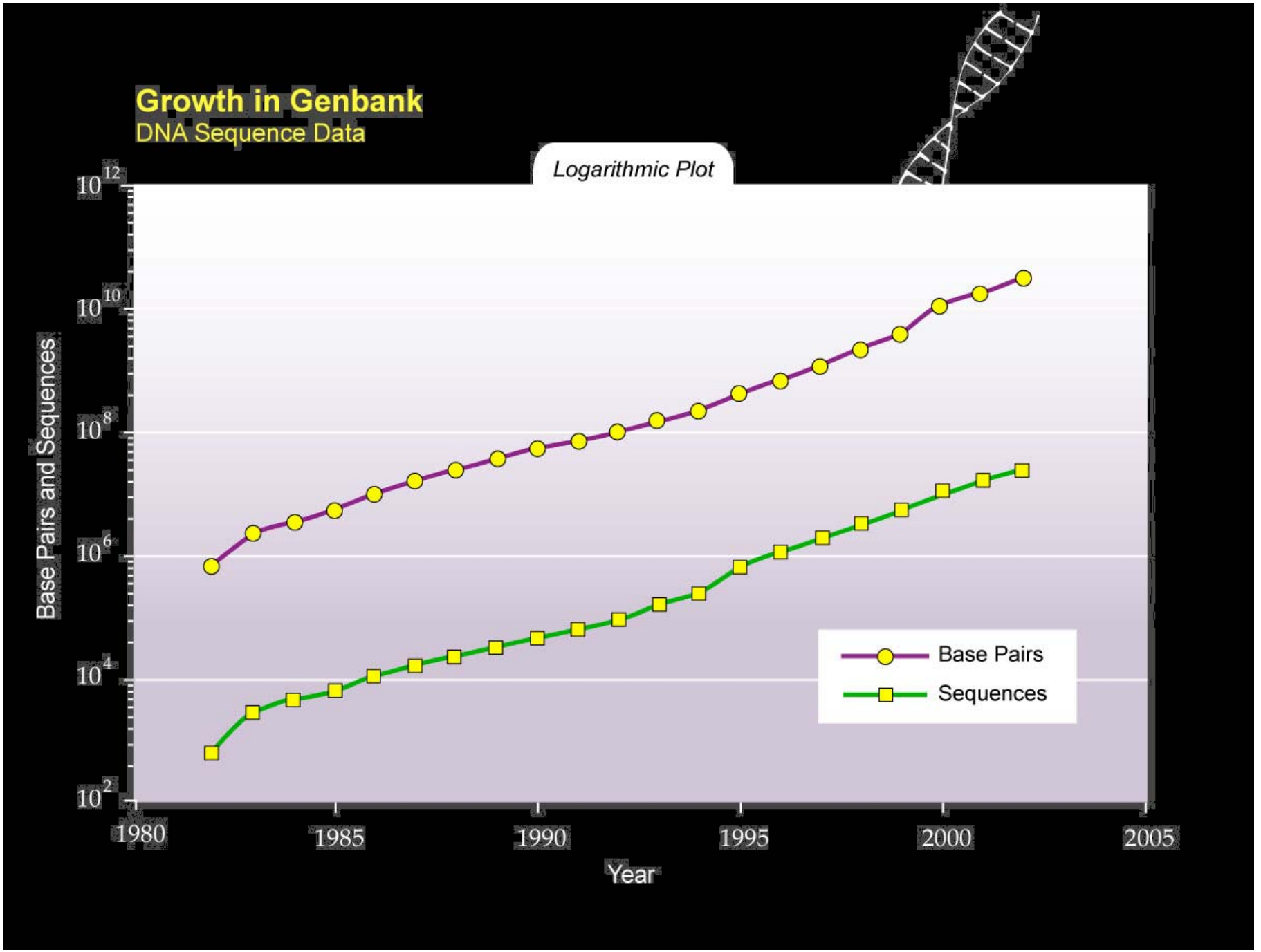
Article 19.

Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference *and to seek, receive and impart information and ideas through any media and regardless of frontiers.*

http://www.un.org/Overview/rights.html

"The field of knowledge is the common property of all mankind "

Thomas Jefferson 1807


Growth in Genbank
DNA Sequence Data
Logarithmic Plot
Base Pairs and Sequences
10^{12}
10^{10}
10^{8}
10^{6}
10^{4}
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1980
1985
1990
1995
2000
2005
Year
Base Pairs
Sequences

Digital Objects:
Copies, Transformations and Renderings

Digital Objects

Objects

A collection is made up from digital objects. There are two kinds of object. Some are surrogates for the case where the original exists in analog form (ie books or papers). Others are born digital (databases, remote sensed data, GIS layers).

Objects might exist in master or preservation form and as use copies. The latter might be at lower resolution fitter for many purposes (a 35mm slide might be mastered as an 18Mb TIFF but served as a derived 15Kb JPEG for instance).

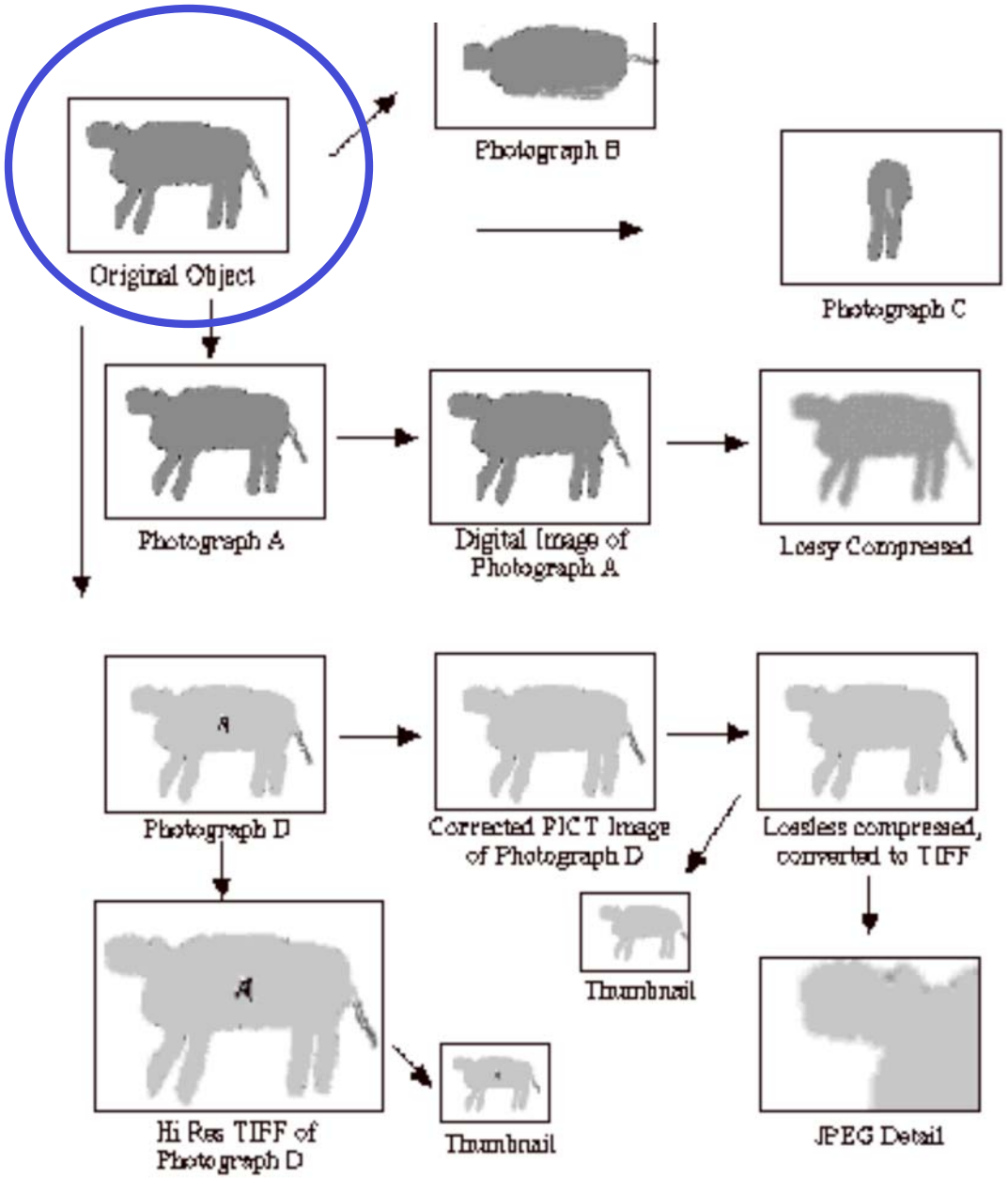
"*Digital* Objects"?

Digital objects (as *potential* "*public goods*") are:

- *non-rivalrous* **(near-zero cost for additional increments of use)**
- *non-excludable* **(i.e.of potentially universal benefit)**
- *universally accessible* (potentially)
- But economic inequities and newly emergent legal/technical barriers may deny these benefits

Reichman, Jerome H. and Paul F. Uhlir, Promoting Public Good Uses of Scientific Data: A Contractually Reconstructed Commons for Science and Innovation. <http://www.law.duke.edu/pd/papers/ReichmanandUhlir.pdf>

"Image Families"

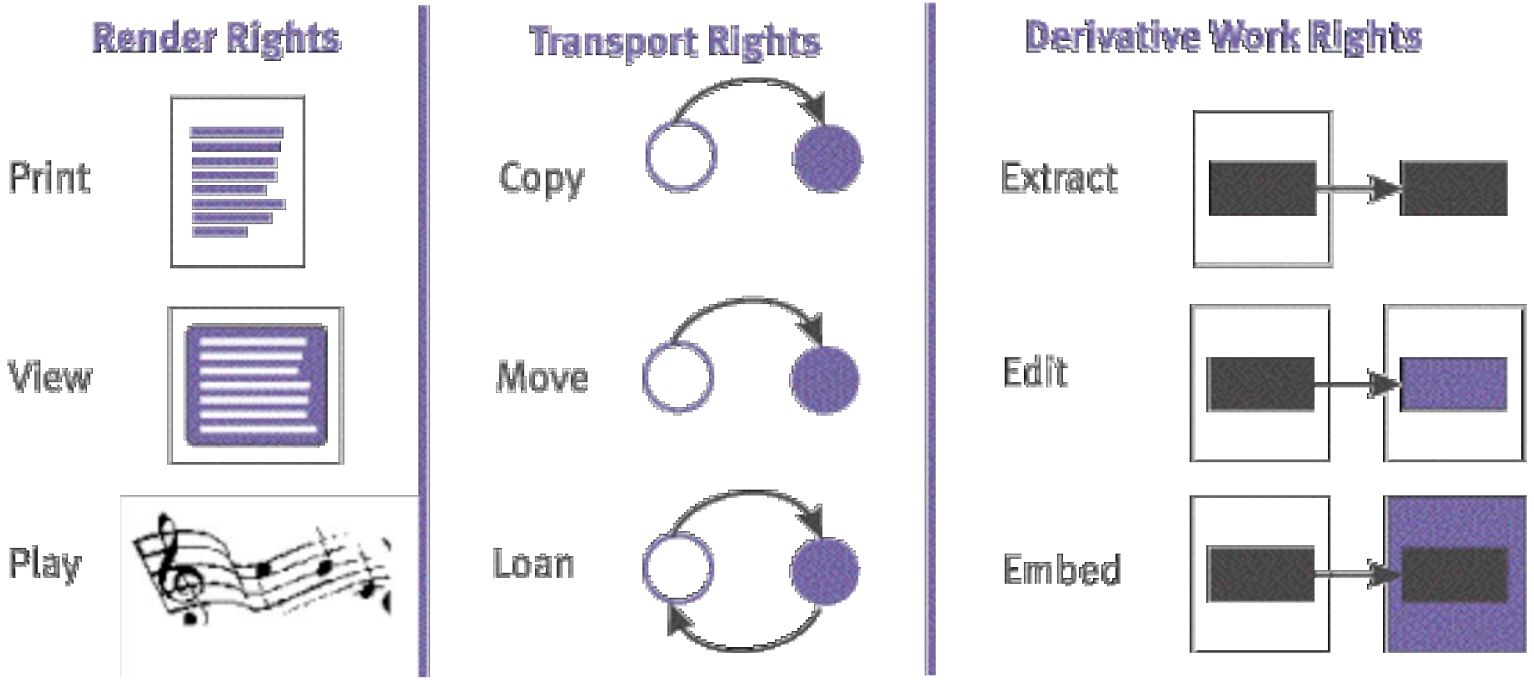


Optimal use of *digital objects* depends on ***"heritability"***-- defined in terms of:

- technical integrity (of image)
- semantic properties
- legal ownership

From: Howard Besser. The Next Stage: Moving from Isolated Digital Collections to Interoperable Digital Libraries by First Monday, volume 7, number 6 (June 2002), URL: http://firstmonday.org/issues/issue7_6/besser/index.html

TYPES OF USES
That *May* Be Addressed by Fair Use



The 2003 OCLC Environmental Scan: Pattern Recognition (A report to the OCLC Membership) Dublin, Ohio, OCLC Online Computer Library Center, 2004. p.45.

Calibration…?

Table 1.1: How Big is an Exabyte?	
Kilobyte (KB)	**1,000 bytes OR 10^3bytes** **2 Kilobytes: A Typewritten page.** **100 Kilobytes: A low-resolution photograph.**
Megabyte (MB)	**1,000,000 bytes OR 10^6 bytes** **1 Megabyte: A small novel OR a 3.5 inch floppy disk.** **2 Megabytes: A high-resolution photograph.** **5 Megabytes: The complete works of Shakespeare.** **10 Megabytes: A minute of high-fidelity sound.** **100 Megabytes: 1 meter of shelved books.** **500 Megabytes: A CD-ROM.**
Gigabyte (GB)	**1,000,000,000 bytes OR 10^9 bytes** **1 Gigabyte: a pickup truck filled with books.** **20 Gigabytes: A good collection of the works of Beethoven.** **100 Gigabytes: A library floor of academic journals.**
Terabyte (TB)	**1,000,000,000,000 bytes OR 10^{12} bytes** **1 Terabyte: 50000 trees made into paper and printed.** **2 Terabytes: An academic research library.** **10 Terabytes: The print collections of the U.S. Library of Congress.** **400 Terabytes: National Climactic Data Center (NOAA) database.**
Petabyte (PB)	**1,000,000,000,000,000 bytes OR 10^{15} bytes** **1 Petabyte: 3 years of EOS data (2001).** **2 Petabytes: All U.S. academic research libraries.** **20 Petabytes: Production of hard-disk drives in 1995.** **200 Petabytes: All printed material.**
Exabyte (EB)	**1,000,000,000,000,000,000 bytes OR 10^{18} bytes** **2 Exabytes: Total volume of information generated in 1999.** **5 Exabytes: All words ever spoken by human beings.**

UCB SIMS. How much information? 2003 Executive Summary
http://www2.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm "**Many of these examples were taken from Roy Williams ?Data Powers of Ten? web page at Caltech."**

Technological Convergence?

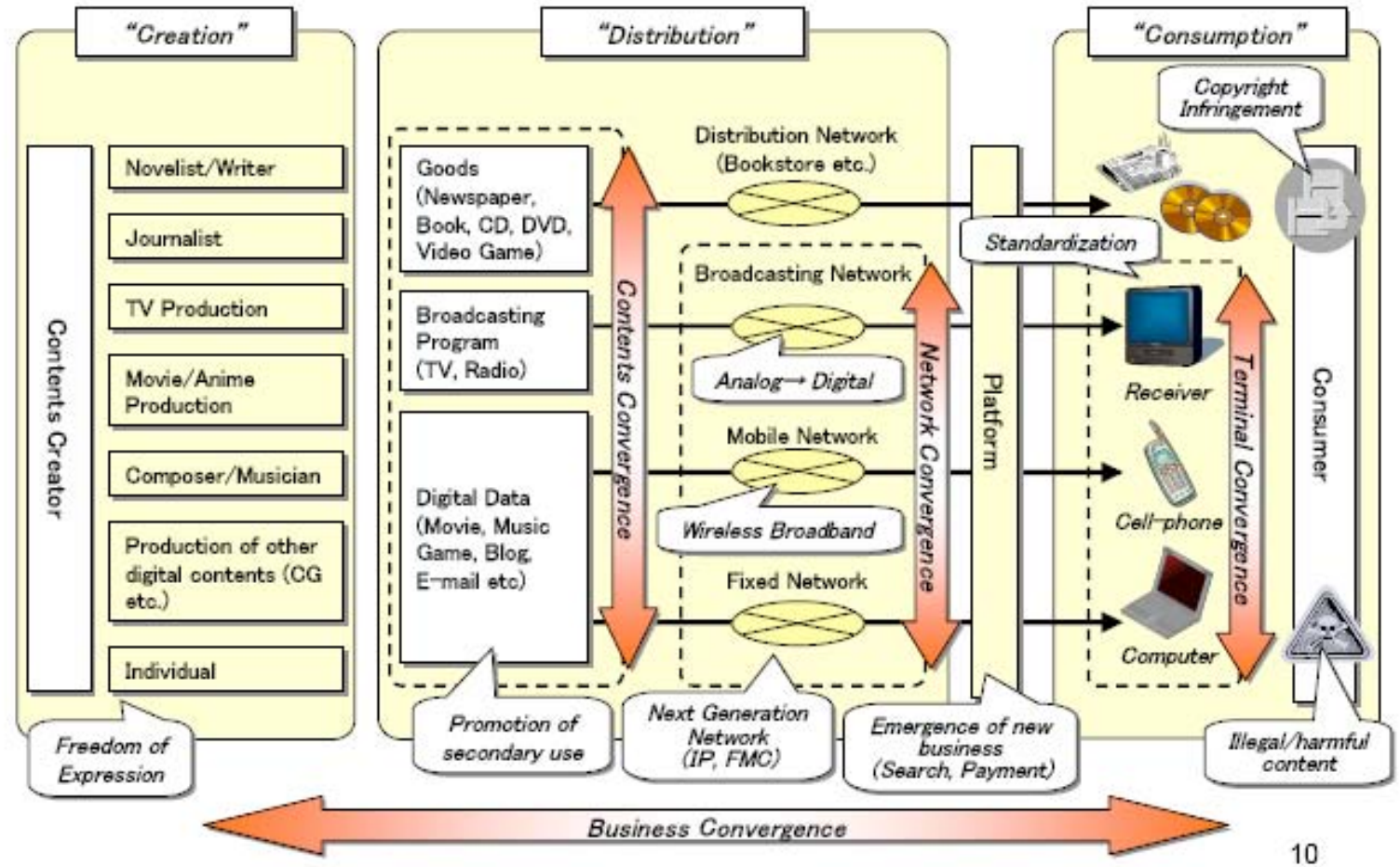
- Shortening Developmental Cycles
  - Technical?
  - Intellectual?
- Hardware
- Software
- Standards
- Networking / Interoperability
- Users -- Globally Diverse – often unexpected…
- Knowledge Creation / Publishing

Sharing Knowledge at Macro- and Micro- Levels:

- ***Investment: Mission / Margin***
- ***Discovery / Creation***
  - ***Formal***
  - ***Explicit but informal ("Gray"?)***
  - ***Non-textual***
  - ***Latent / Implicit Knowledge?***
- ***Authorship / Compilation***
  - ***Collaborative Tools***
- ***Editing***
  - ***Copy-editing***
  - ***Metadata / Indexing / Tagging***
  - ***Prepress/ Composition / Formatting / "Certification" / Peer Review***
- ***Production***
  - ***Paper/Print***
  - ***Print-on-demand***
  - ***"Born Digital"***
- ***Promotion / "Marketing"***
  - ***"Social Marketing"***
- ***Licensing / DRM – Proprietary Dilemma***
  - ***Restrictions and Copyright***
  - ***Creative Commons / Science Commons***
  - ***Public Domain***
- ***Digital Capture***
  - ***Building In-house Capacity***
  - ***Outsourcing – Commercial Vendors***
  - ***Develop Scanning Resource Centers***
    - ***Colorado Digitization Project Model***
    - ***NE Doc. Center [Boston]***
- ***Dissemination***
  - ***Sales – Services/Commodity Model?***
  - ***Distribution***
  - ***Hosting (Associative Value – Context Sensitive)***
- ***Uses / "Responsible Use"***
- ***Evaluation?***
  - ***Explicit Review***
  - ***Citation / Linking / Imbedding Downloading / "Impact"***
  - ***Application***
- ***Archiving***
  - ***Individual / Institutional***
  - ***Trusted Digital Repositories***
  - ***LOCKSS***

Outline Schema developed by the Publications Working Group Conservation Commons
(IUCN, Gland Switzerland 2005)

6. Evolution of ICT market structure



Japan. Ministry of Internal Affairs and Communications,
http://www.oecd.org/dataoecd/15/44/36134189.pdf

“Content”?

"How much new information per person?"

"According to the Population Reference Bureau, the world population is 6.3 billion, thus almost 800 MB of recorded information is produced per person each year. It would take about 30 feet of books to store the equivalent of 800 MB of information on paper."

UCB SIMS. How much information? 2003 Executive Summary
http://www2.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm

“We estimate that the amount of new information stored on paper, film, magnetic, and optical media has about doubled in the last three years.”

UCB SIMS. How much information? 2003 Executive Summary
http://www2.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm

Paper

A tree can produce about 80,500 sheets of paper, thus it requires about 786 million trees to produce the world's annual paper supply.

The UNESCO Statistical Handbook for 1999 estimates that paper production provides 1,510 sheets of paper per inhabitant of the world on average. But paper consumption is not equal:

Annually each of the inhabitants of North America consumes 11,916 sheets of paper (24 reams), and inhabitants of the European Union consume 7,280 sheets of paper (15 reams).

At least half of this paper is used in printers and copiers to produce office documents.

UCB SIMS. How much information? 2003 Executive Summary
http://www2.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm

Paper

Table 1.4: United States production of printed original content, if stored digitally in terabytes circa 2002. Upper estimate is scanned; lower estimate is compressed.

Storage Medium	Type of Content	Terabytes/Yr Upper Estimate	1999 Upper Estimate	% Change Upper Estimates
Paper	Books	5.5	3	***83%***
	Newspapers	13.5	13	4%
	Office Documents	559	390	***43%***
	Mass market periodicals	3.5	13	-73%
	Journals	1.6	2	-20%
	Newsletters	0.3	0.2	50%
	U.S. Mail	6,230	5,940	4.8%
	Subtotal	**6,813**	**6,361**	**7.1%**

UCB SIMS. How much information? 2003 Executive Summary
http://www2.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm

Film

Table 1.5: Worldwide production of filmed original content, if stored digitally, in terabytes circa 2002.						
Storage Medium	**Type of Content**	**Terabytes /Yr Upper Estimate**	**Terabytes/Yr Lower Estimate**	**1999 Upper Estimate**	**1999 Lower Estimate**	**% Change Upper Estimates**
Film	Photographs	375,000	37,500	410,000	41,000	***-9%***
	Cinema	6,078	12	4,490	9	***35%***
	Made for TV films	2,531	2,530	N/A	N/A	N/A
	TV series	14,155	14,155	N/A	N/A	N/A
	Direct to video	2,490	2,490	N/A	N/A	N/A
	X-Rays	20,000	20,000	17,200	17,200	16%
	Subtotal	**420,254**	**74,202**	**431,690**	**58,209**	**-2.6%**

UCB SIMS. How much information? 2003 Executive Summary
http://www2.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm

Magnetic Media

Table 1.6: Worldwide production of magnetic original content, if stored digitally using standard compression methods, in terabytes circa 2002.						
Storage Medium	**Type of Content**	**Terabytes/ Yr Upper Estimate**	**Terabytes/ Yr Lower Estimate**	**1999 Report Upper Estimate**	**1999 Report Lower Estimate**	**% Change Upper Estimates**
Magnetic	Videotape	1,340,000	1,340,000	1,420,000	1,420,000	***-6%***
	Audiotape	128,800	128,800	182,000	182,000	***-30%***
	Digital tape	250,000	250,000	250,000	250,000	0
	MiniDV	1,265,000	1,265,000	N/A	N/A	N/A
	Floppy disc	80	80	70	70	14%
	Zip	350	350	1,690	1,690	***-79%***
	Audio MD	17,000	17,000	N/A	N/A	N/A
	Flash	12,000	12,000	N/A	N/A	N/A
	Hard Disk	1,986,000	403,000	926,000	220,000	***114%***
	TOTAL	**4,999,230**	**3,416,230**	**2,779,760**	**2,073,760**	**80%**

UCB SIMS. How much information? 2003 Executive Summary
http://www2.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm

Optical

Table 1.7: Worldwide production of optical original content, if stored digitally using standard compression methods, in terabytes circa 2002.						
Storage Medium	*Genre*	*Terabytes/ Yr Upper Estimate*	*Terabytes/ Yr Lower Estimate*	*1999 Upper Estimate*	*1999 Lower Estimate*	*% Change Upper Estimates*
Optical	*Audio CD*	*58*	*6*	*58*	*6*	*0*
	CD ROM	*1.1*	*1.1*	*0.7*	*0.7*	***57%***
	DVD	*43.8*	*43.8*	*22*	*22*	***99%***
	Subtotal	*102.9*	*50.9*	*80.7*	*28.7*	*28%*

UCB SIMS. How much information? 2003 Executive Summary
http://www2.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm

Optical

The U.S. produces 37% of the world's audio CD titles, 50% of the CD ROM titles, and 40% of the DVD titles.

Table 1.8: United States production of optical original content, if stored digitally using standard compression methods, in terabytes circa 2002.

Storage Medium	*Genre*	*Terabytes/ Yr Upper Estimate*	*Terabytes/ Yr Lower Estimate*	*1999 Upper Estimate*	*1999 Lower Estimate*	*% Change Upper Estimates*
Optical	*Audio CD*	*22*	*2*	*22*	*2*	*0*
	CD ROM	*0.55*	*0.06*	*1*	*0.3*	***-45%***
	DVD	*18*	*18*	*13*	*13*	***38%***
	Subtotal	*40.55*	*20.06*	*36*	*15.3*	*13%*

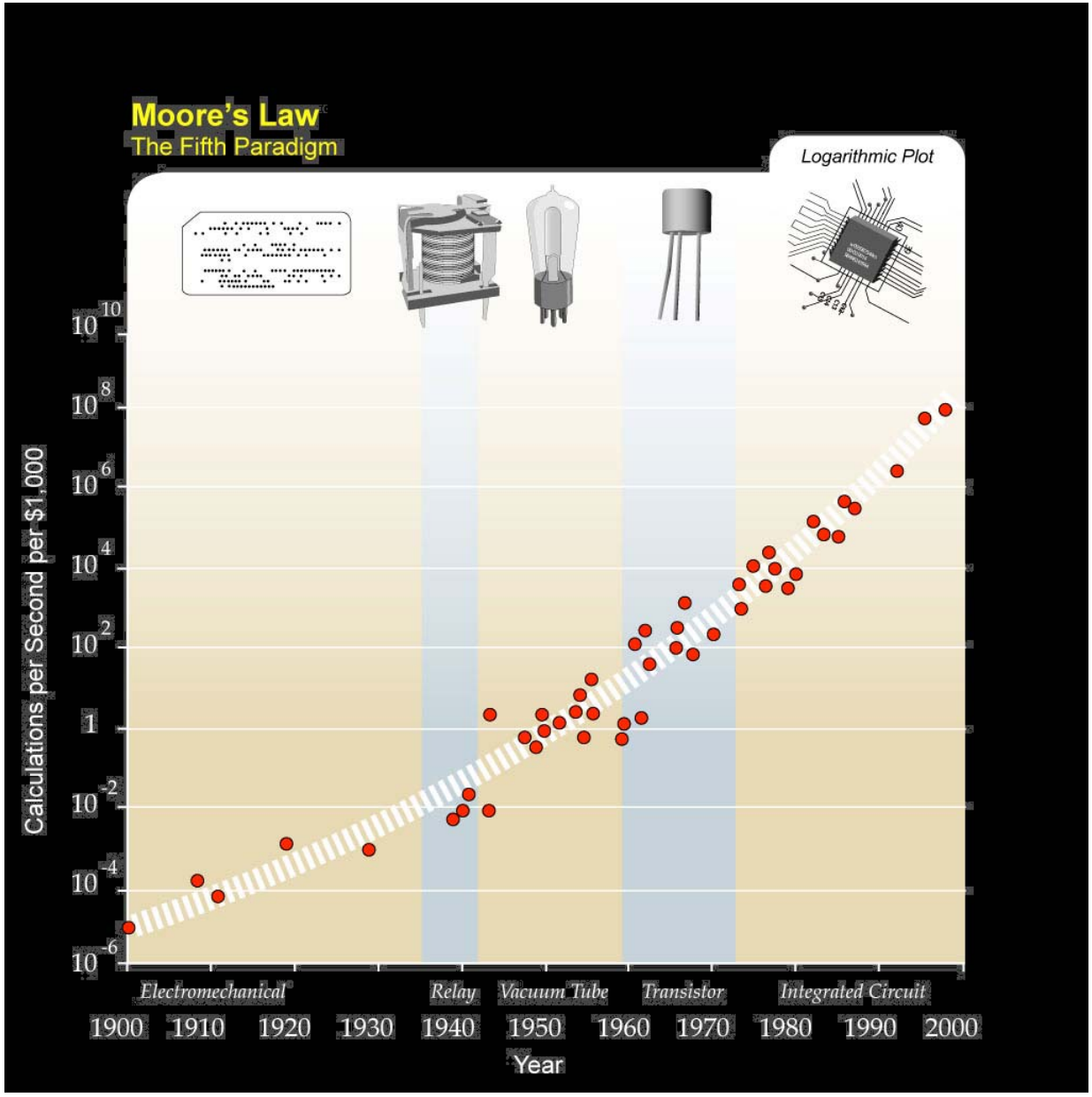
UCB SIMS. How much information? 2003 Executive Summary
http://www2.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm

Shortening Cycles of Technical Development

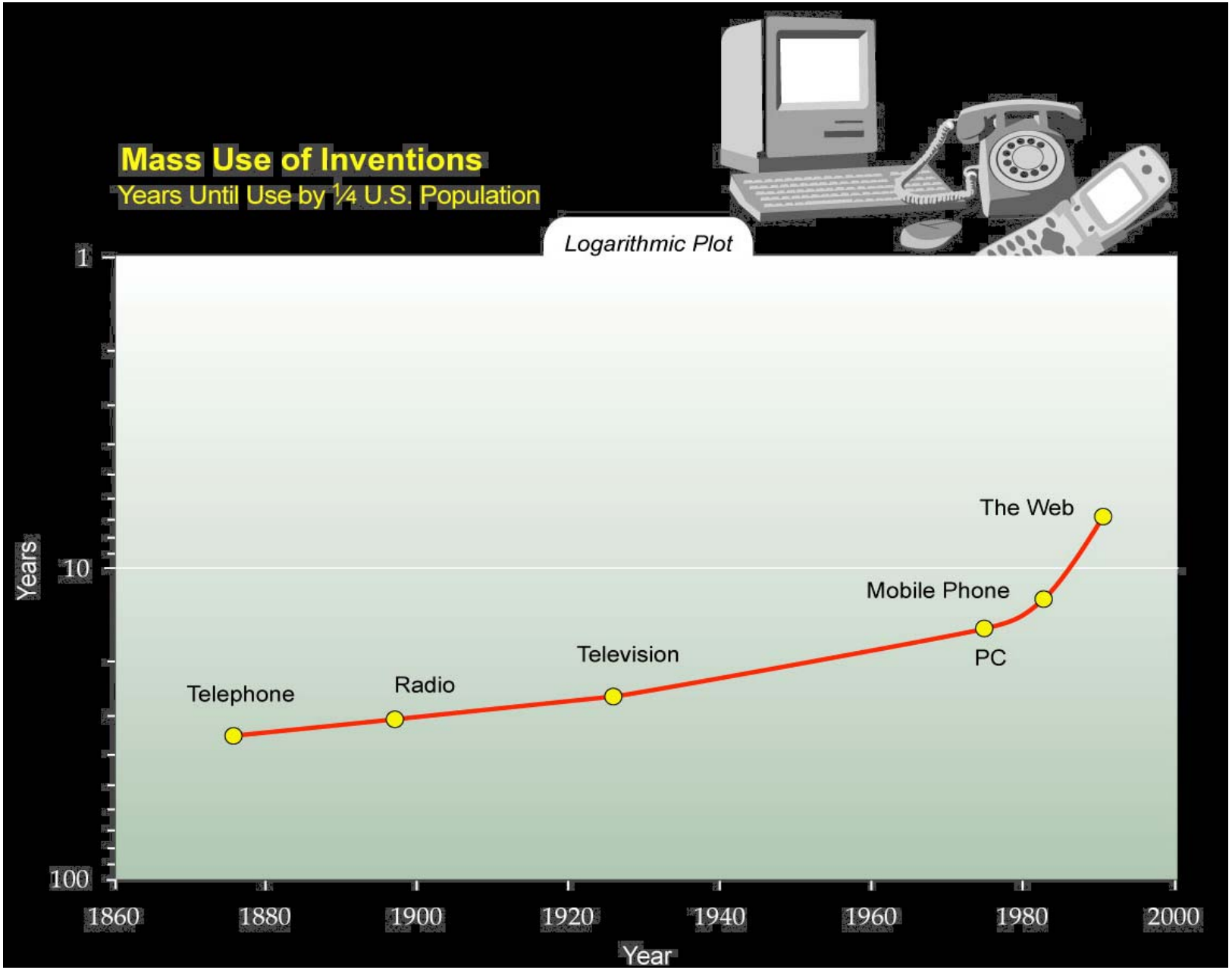
"The Paradigm Shift Rate is now doubling every decade…"

-- Ray Kurzweil

"Biotechnology and Nanotechnology: Two Overlapping Health Revolutions" Ray Kurzweil at The World Health Care Innovation and Technology Congress November 9, 2005 www.KurzweilAI.net/pps/WorldHealthCongress/



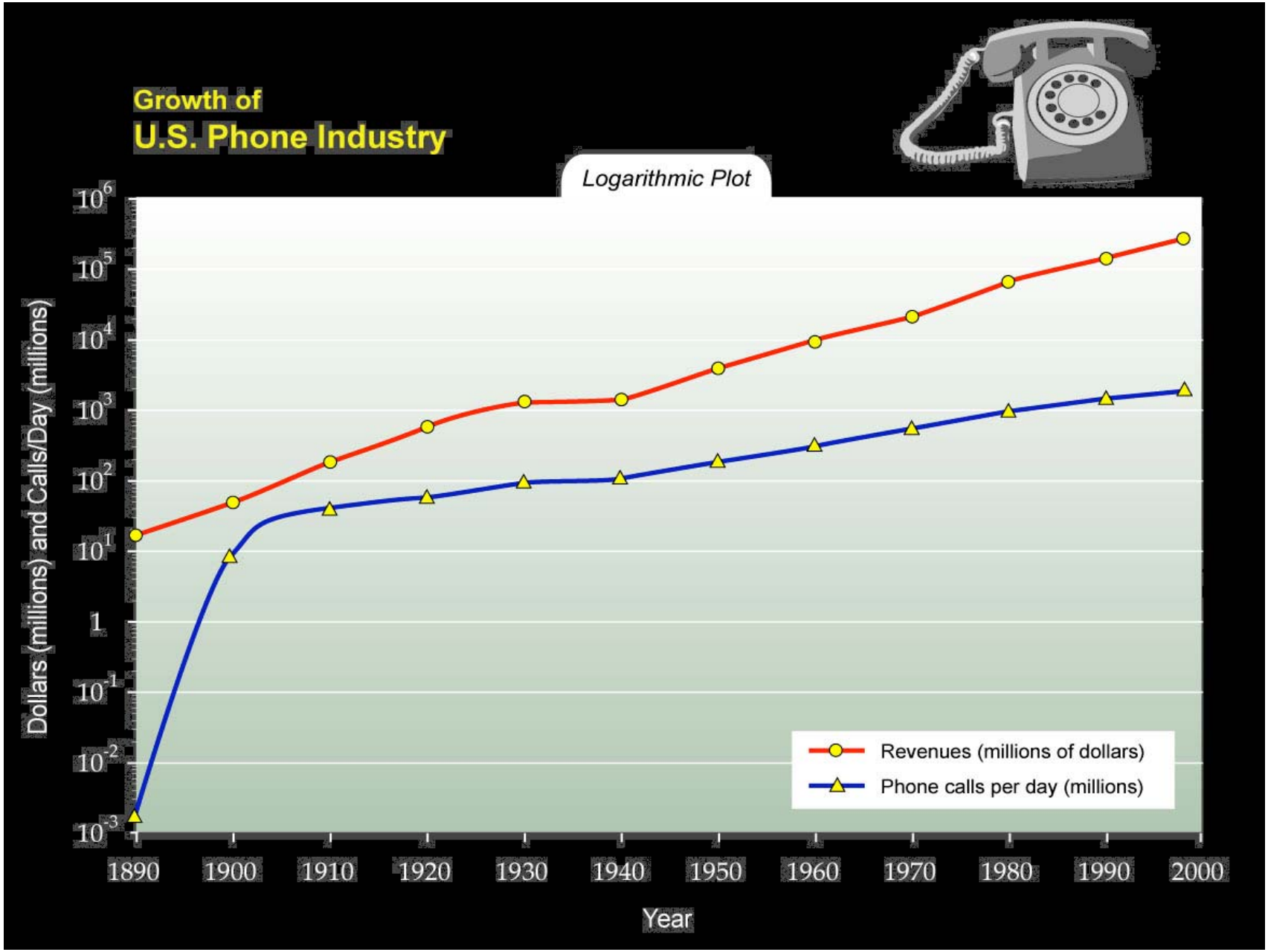
"Biotechnology and Nanotechnology: Two Overlapping Health Revolutions" Ray Kurzweil at The World Health Care Innovation and Technology Congress November 9, 2005 www.KurzweilAI.net/pps/WorldHealthCongress/



"Biotechnology and Nanotechnology: Two Overlapping Health Revolutions" Ray Kurzweil at The World Health Care Innovation and Technology Congress November 9, 2005 www.KurzweilAI.net/pps/WorldHealthCongress/

"Information Technologies
(of all kinds)
double their power
(price performance, capacity, bandwidth)
every year."

"Biotechnology and Nanotechnology: Two Overlapping Health Revolutions" Ray Kurzweil at The World Health Care Innovation and Technology Congress November 9, 2005 www.KurzweilAI.net/pps/WorldHealthCongress/



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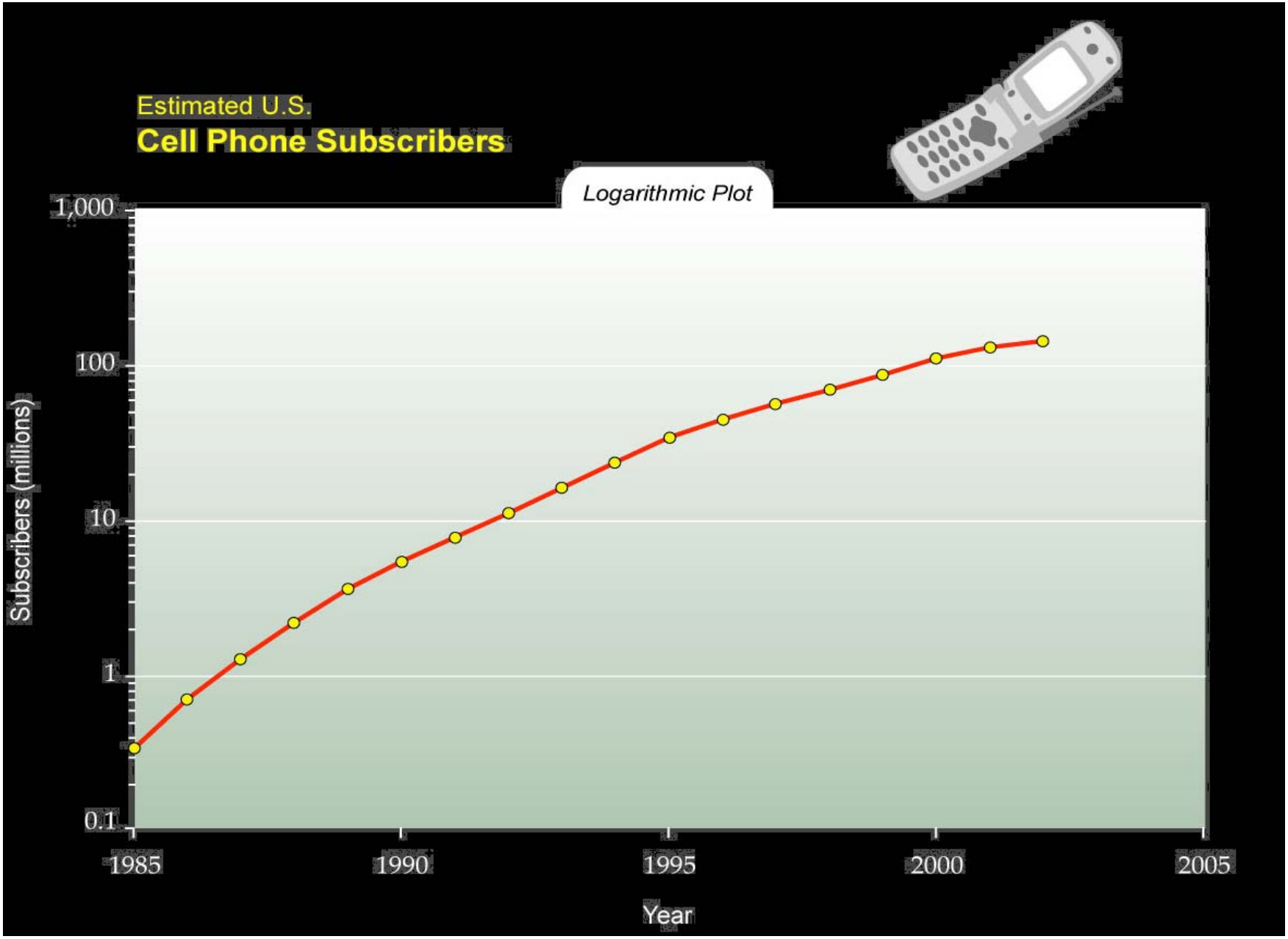


"Biotechnology and Nanotechnology: Two Overlapping Health Revolutions" Ray Kurzweil at The World Health Care Innovation and Technology Congress November 9, 2005 www.KurzweilAI.net/pps/WorldHealthCongress/

"Every form of communications technology is doubling price-performance, bandwidth, capacity every 12 months."

"Biotechnology and Nanotechnology: Two Overlapping Health Revolutions" Ray Kurzweil at The World Health Care Innovation and Technology Congress November 9, 2005 www.KurzweilAI.net/pps/WorldHealthCongress/

Measure	*MIT's IBM 7094*	*Notebook Circa 2003*
Year	1967	2003
Processor Speed (MIPS)	0.25	1,000
Main Memory (K Bytes)	144	256,000
Approximate Cost (2003 $)	$11,000,000	$2,000

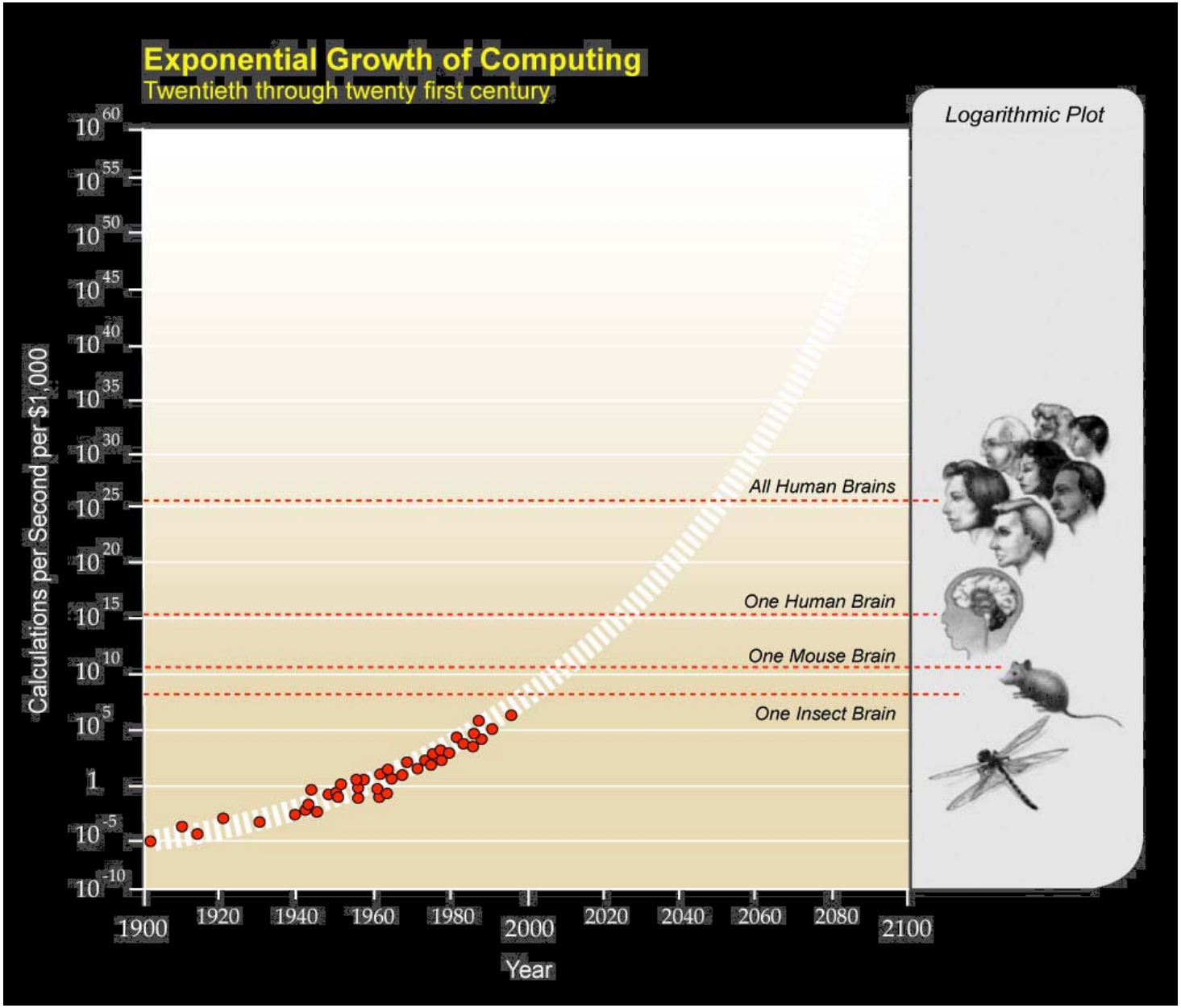
24 Doublings of Price-Performance in 36 years, doubling time: 18 months not including vastly greater RAM memory, disk storage, instruction set, etc.

"Biotechnology and Nanotechnology: Two Overlapping Health Revolutions" Ray Kurzweil at The World Health Care Innovation and Technology Congress November 9, 2005 www.KurzweilAI.net/pps/WorldHealthCongress/

Doubling (or Halving) times

• *Dynamic RAM Memory "Half Pitch" Feature Size*	*5.4 years*
• *Dynamic RAM Memory (bits per dollar)*	*1.5 years*
• *Average Transistor Price*	*1.6 years*
• *Microprocessor Cost per Transistor Cycle*	*1.1 years*
• *Total Bits Shipped*	*1.1 years*
• *Processor Performance in MIPS*	*1.8 years*
• *Transistors in Intel Microprocessors*	*2.0 years*
• *Microprocessor Clock Speed*	*2.7 years*

"Biotechnology and Nanotechnology: Two Overlapping Health Revolutions" Ray Kurzweil at The World Health Care Innovation and Technology Congress November 9, 2005 www.KurzweilAI.net/pps/WorldHealthCongress/



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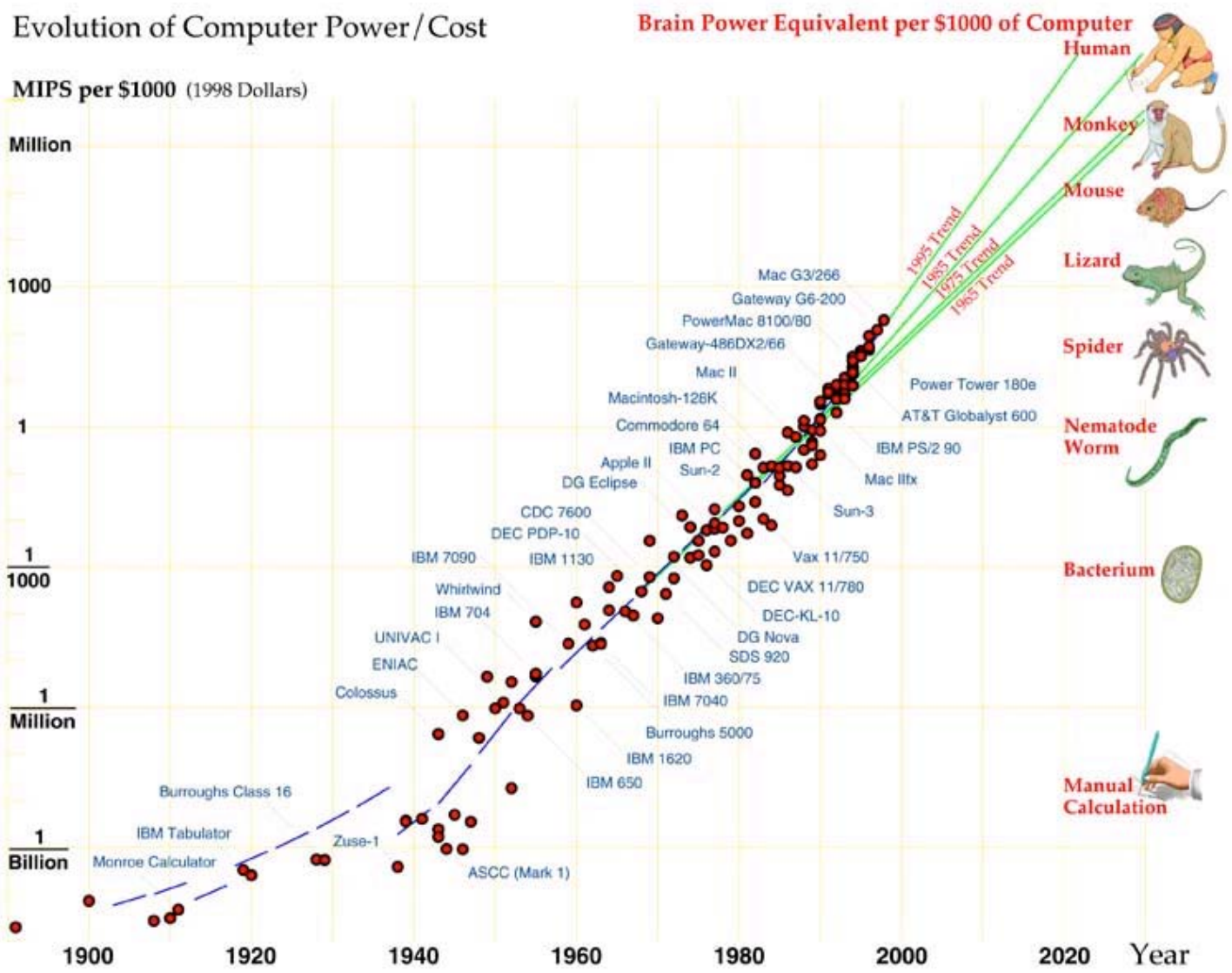

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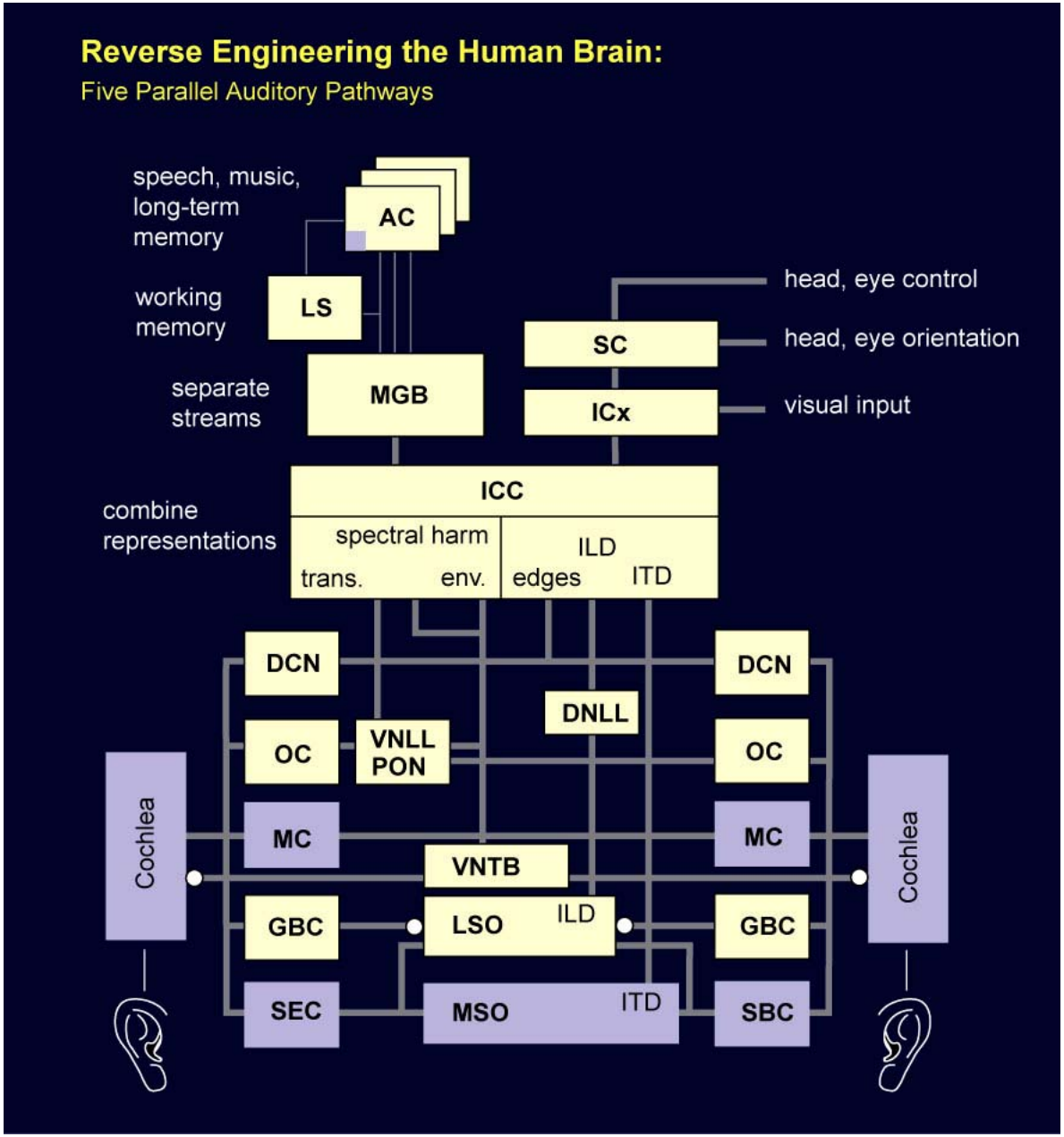

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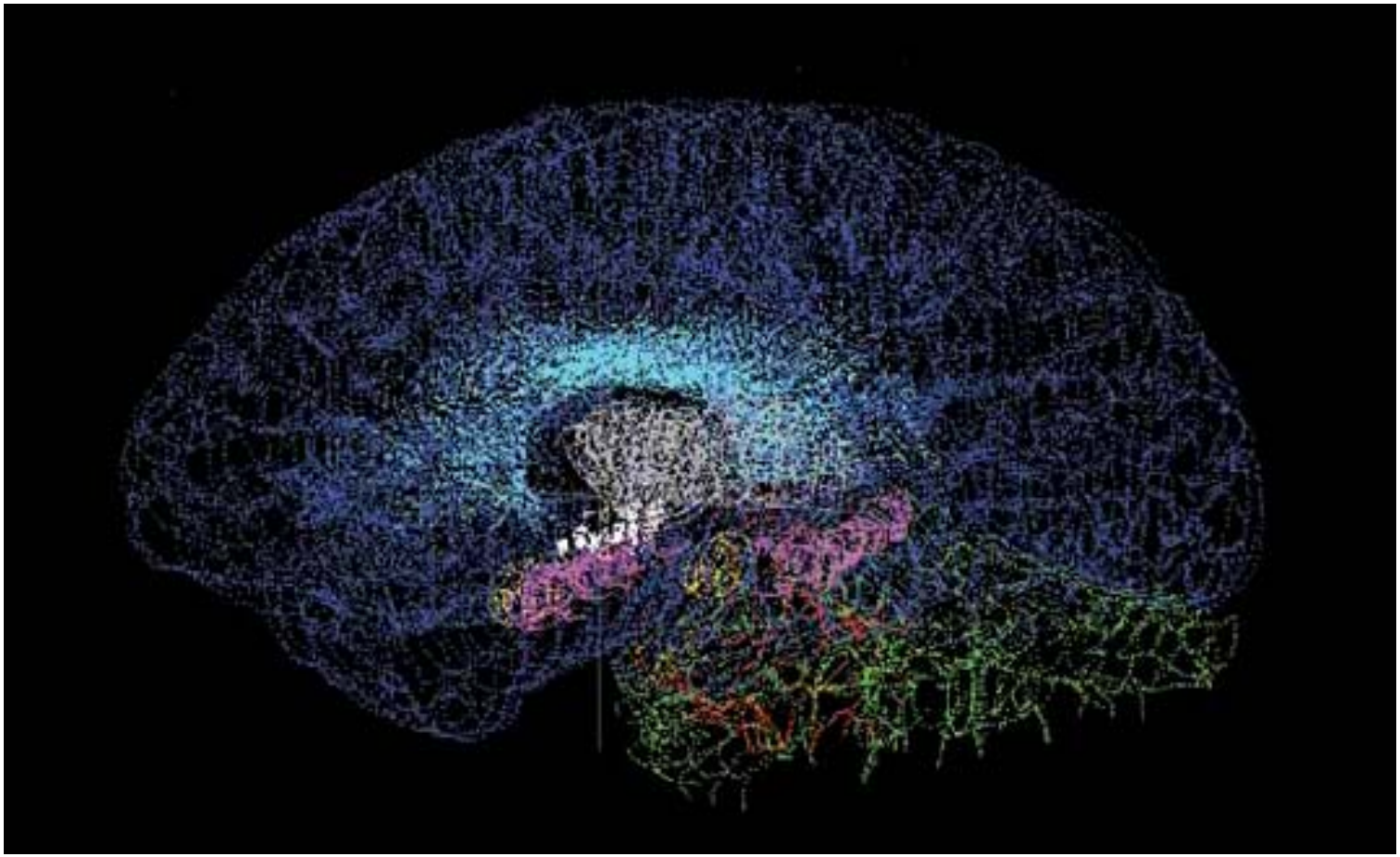
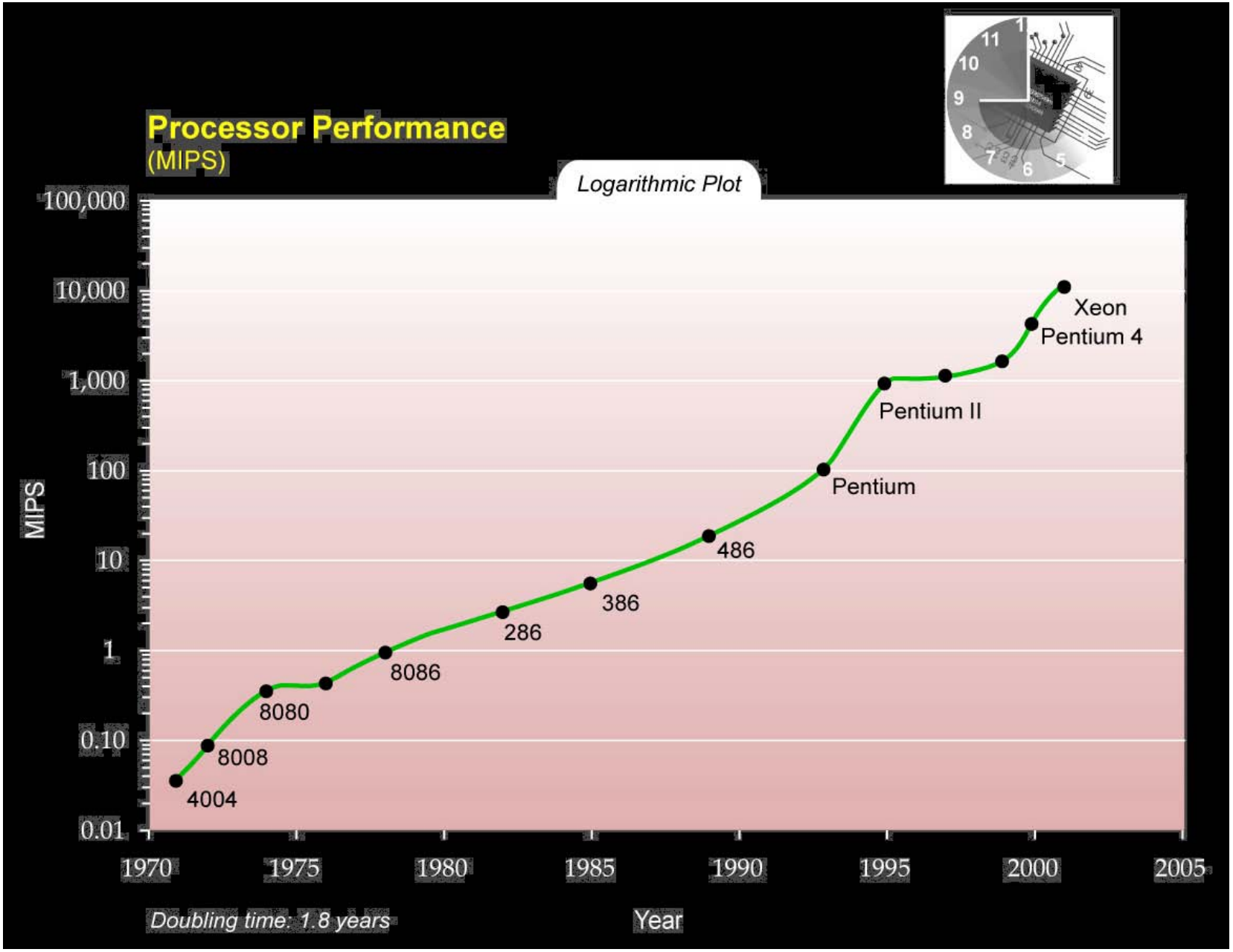


A 3D model of the human brain (top)

The dark blue structures are the two hemispheres of the cerebral cortex, joined by a major fibre tract, the corpus callosum, shown in light blue. The cerebellum is outlined in green, the thalamus in grey, the hippocampus in pink, and the amygdala in yellow. The system rests atop the brainstem, pons and medulla, which are shown in red.

http://research.microsoft.com/towards2020science/downloads/T2020S_Report.pdf

Hardware



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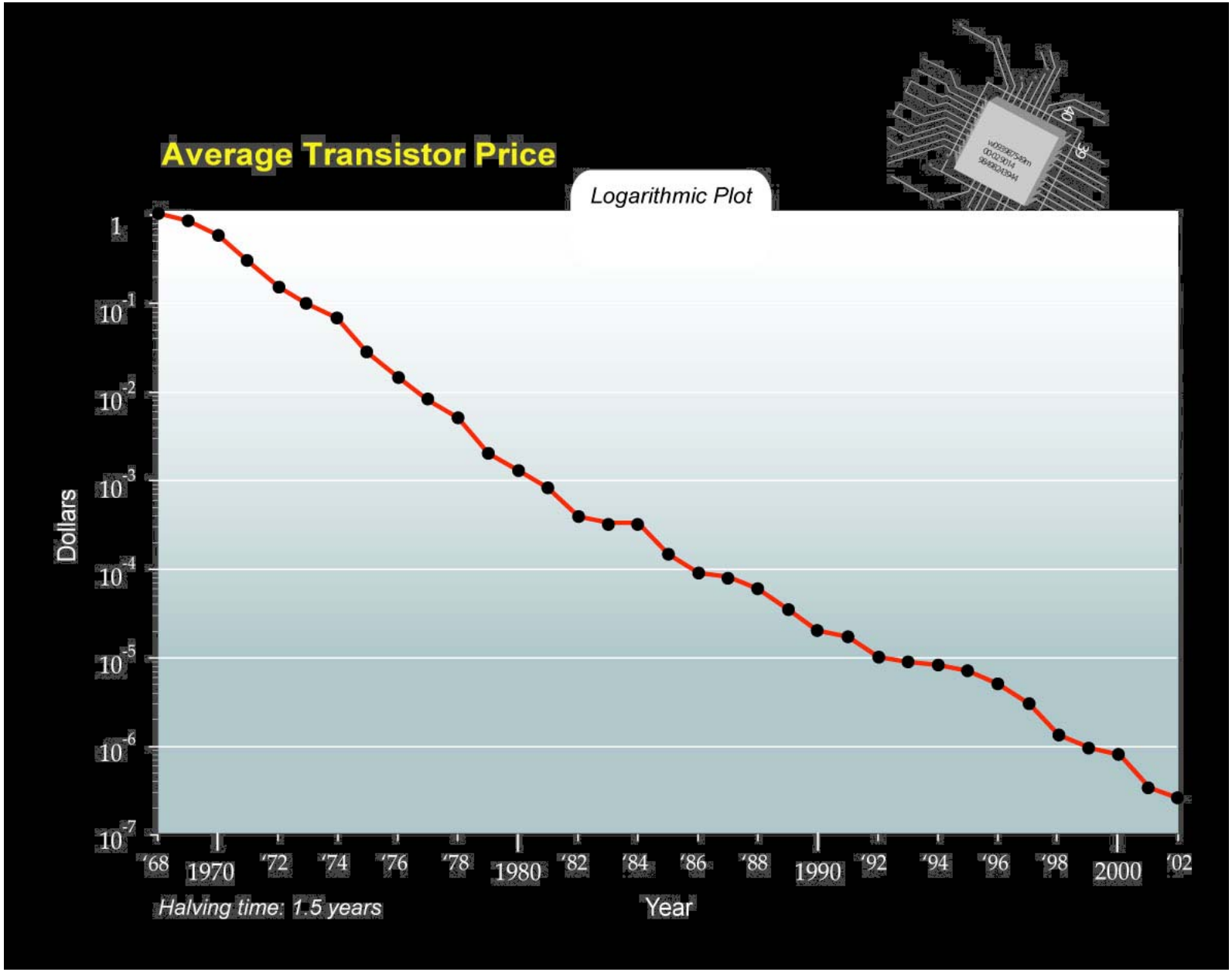

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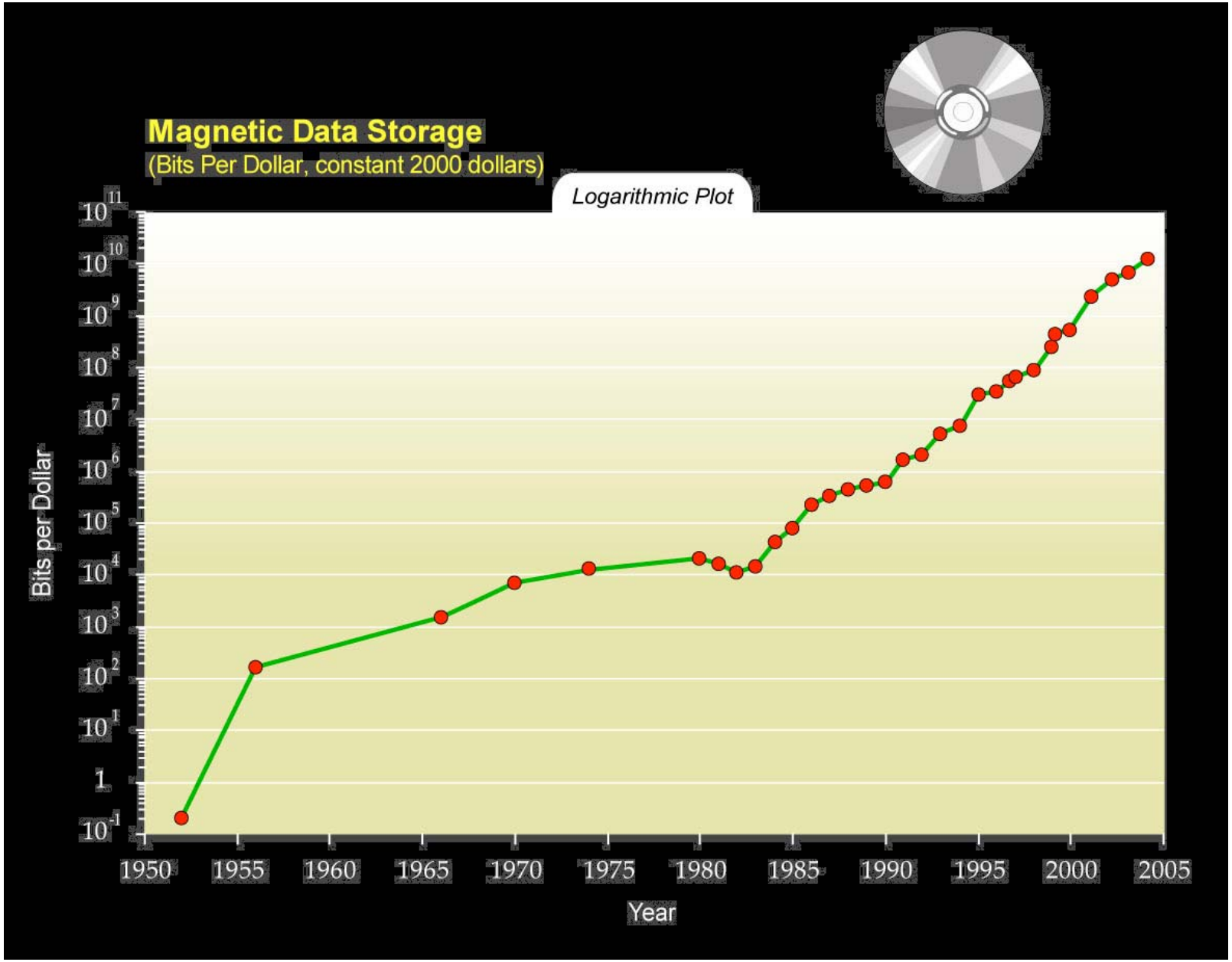

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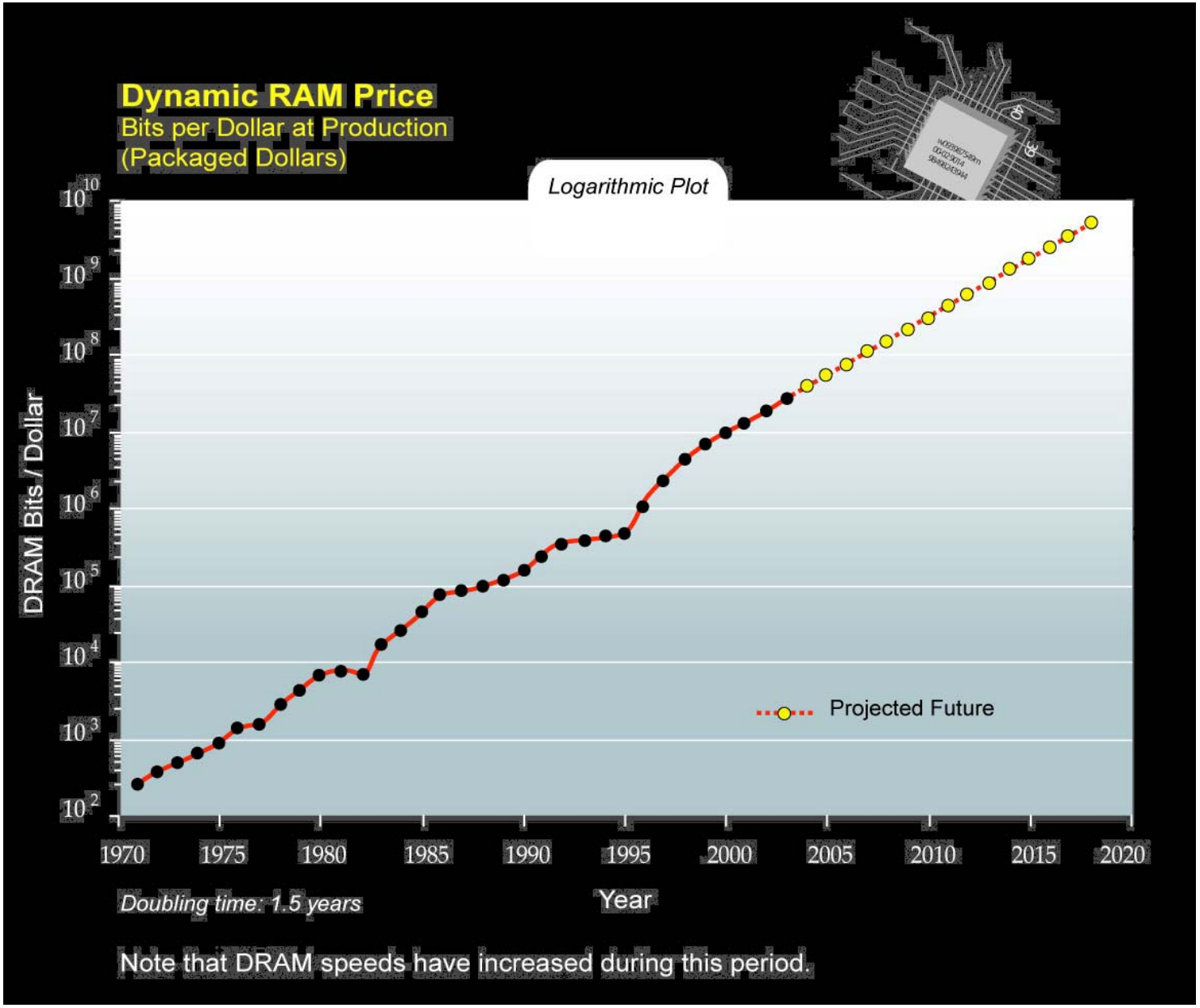

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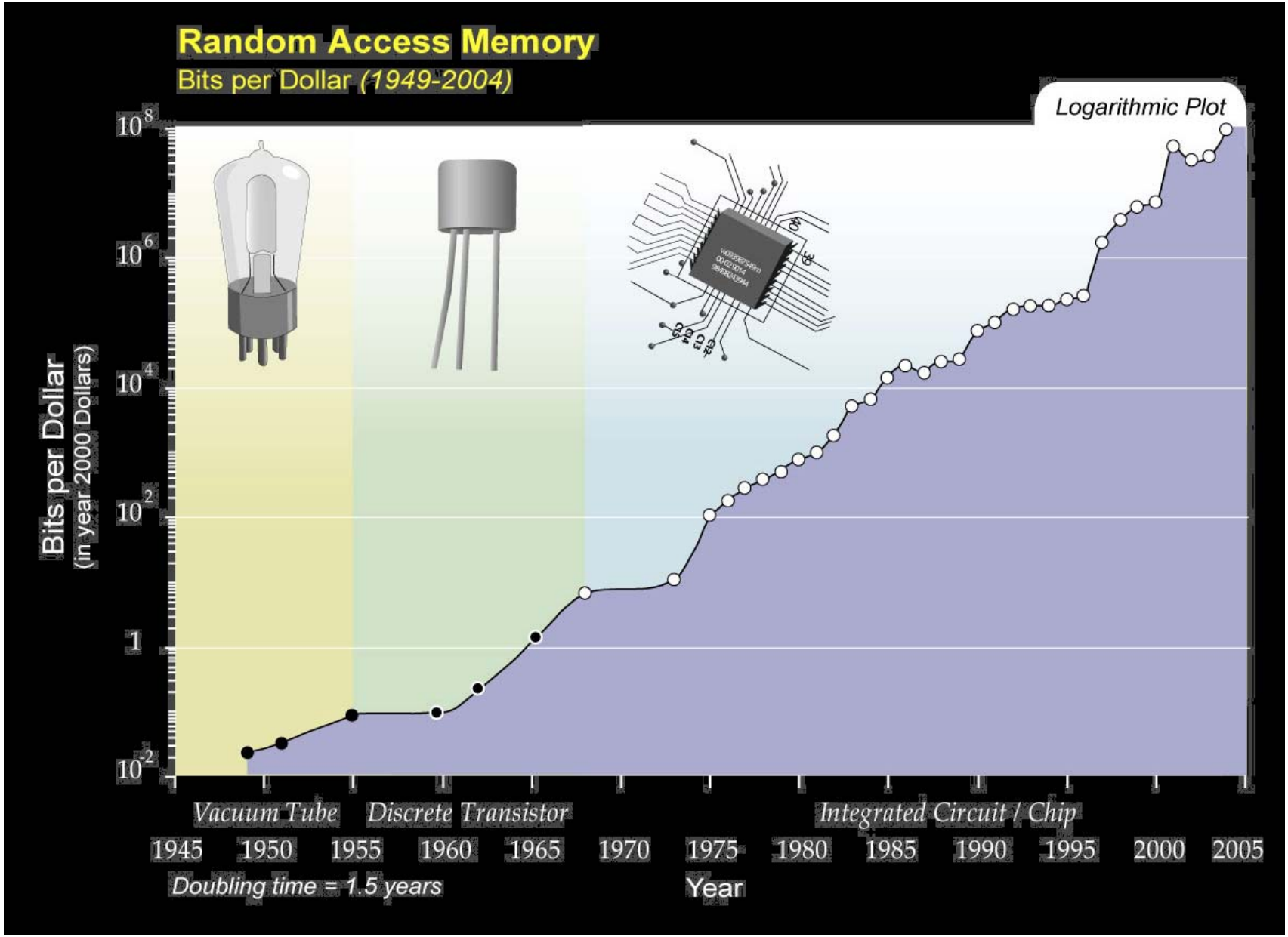

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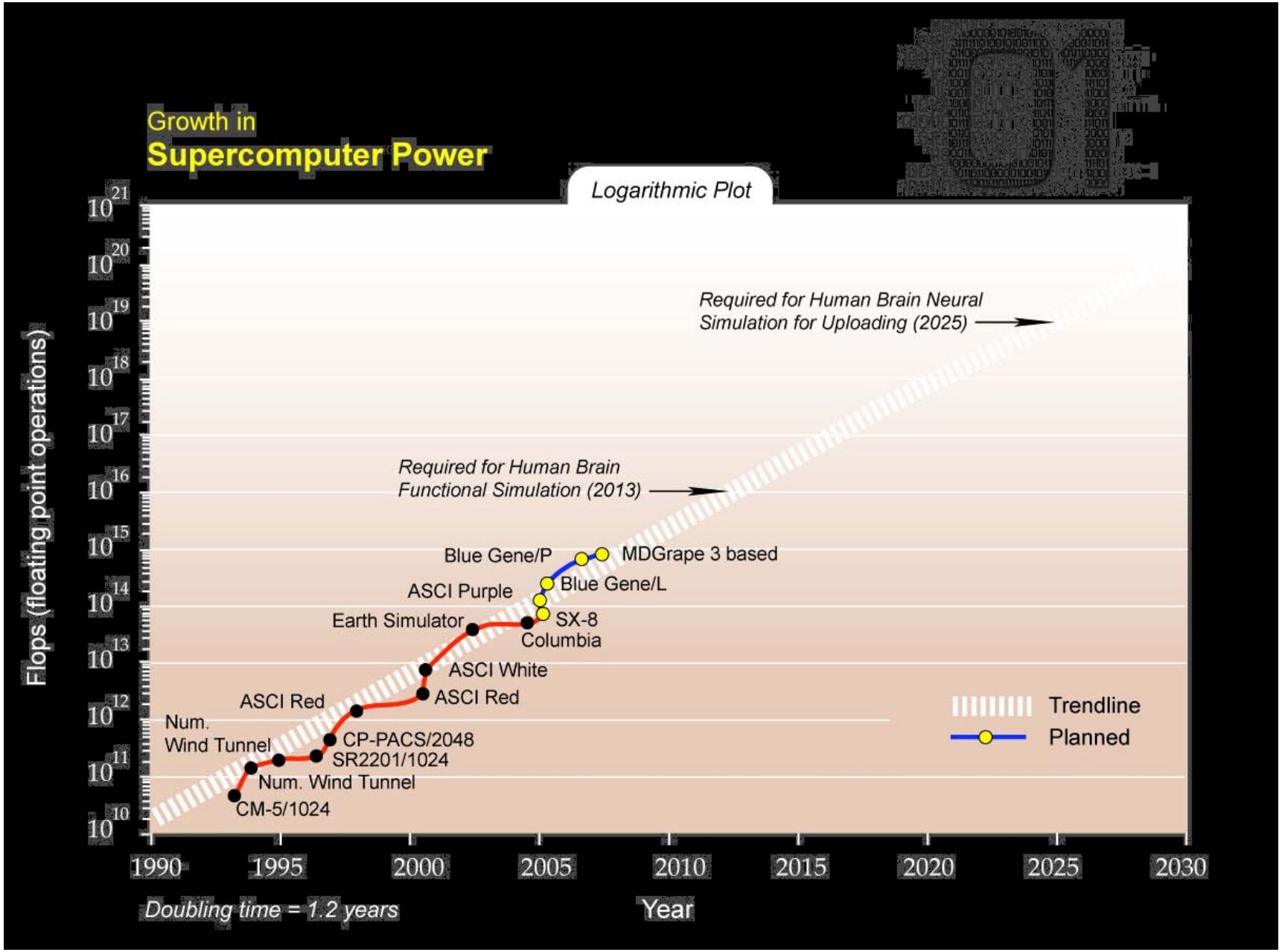

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Capture/Scanning/Imaging


116
Building 116
Internet Archive


TOPNET 2001
HALF


print your own book!
FREE
archive.org
BookMobile
1,000,000 Books Inside (soon)
FREE
archive.

https://www.lightningsource.com/index.htm

SoftWare / Metadata / Standards

Open Source Software

- **Operating Systems**
- **Linux:** the most used Unix-like operating system on the planet. Versions have been run on anything from a handheld computers and regular PCs, to the world's most powerful supercomputers. For a list of popular Linux distributions, look here.
- FreeBSD, OpenBSD, and NetBSD: The BSDs are all based on the Berkeley Systems Distribution of Unix, developed at the University of California, Berkeley. Another BSD based open source project is Darwin, which is the base of Apple's Mac OS X.
- **Internet**
- Apache, which runs over 50% of the world's web servers.
- BIND, the software that provides the DNS (domain name service) for the entire Internet.
- sendmail, the most important and widely used email transport software on the Internet.
- Mozilla, the open source redesign of the venerable Netscape Browser, is retaking the ground lost by Netscape in the "browser wars". It has quickly moved from 1.0 to 1.2, adding functionality, stability and cross-platform consistency that is not available from any other browser.
- OpenSSL is the standard for secure communication (strong encryption) over the internet.
- The TCP/IP DNS, SSL, and e-mail servers are especially interesting because they're "category killers"; not only are they extremely capable and robust, they're so good that no commercial competition has ever been successful at replacing them as the most widely used product on their respective categories.
- **Programming Tools**
- Perl, Zope, and PHP, are popular engines behind the "live content" on the World Wide Web.
- Powerful High Level Languages like Python, Ruby, and Tcl/Tk owe much of their success and prevalence to the active community of developers that use them and continue their development.
- The GNU compilers and tools (GCC, Make, Autoconf, and Automake, and others) are arguably the most powerful, flexible, and extensible set of compilers in the world. Almost all open source projects use them as their primary development tools.
- Developer tools are especially well represented, because without open source programming tools, open source software would require proprietary tools to build and maintain it. There are literally hundreds of thousands of popular open source packages, covering every imaginable category of software, and more are being developed every single day.

http://www.opensource.org/docs/products.php

"The UDDI Technology Stack"

Universal Service Interop Protocols (as yet undefined)
Universal Description, Discovery, Integration (UDDI)
Simple Object Access Protocol (SOAP)
Extensible Markup Language (XML)
Common Internet Protocols (HTTP, TCP/IP)

UDDI.org, 10/2000

Proposed Web Services Standards

(Info Week 4/2001)

Standard	Origin	Purpose	Recent Status	Expected Future
UDDI: Unversal Description, Discovery & Integration	**Ariba, IBM & Microsoft Version 1.0 (draft spec.) Sept., 2000**	**A set of XML protocols and an infrastrucuture for the description and discovery of busines processes**	**Draft Version in use by developers not yet sumitted as standard**	**Two more drafts expected in '02-'03 before submission to standards organizations**
SOAP: Simple Object Access Protocol	***DevelopMentor, Micosoft and Userland Feedback on SOAP spec 0.9 sought Sept.'00***	**An XML-based protocol for messaging and RPC-style communication betwqeen two processes**	**SOAP 1.1 released and submitted to W3C May '00 in use by developers**	**W3C XML Protocols WG is working on a SOAP standard to be called "XP"**

Proposed Web Services Standards
(Info Week 4/2001) [cont.]

Standard	Origin	Purpose	Recent Status	Expected Future
WSDL (Web Services Description Language)	**Microsoft & IBM Version1.0 Sept. '00**	**AN XML language used to describe how to connect to a Web service.**	**WSDL spec. 1.0 submitted to W3C March '01**	**W3C undecided**

Automated Peer Review Options

Software Evaluation Matrix for Web based Manuscript Submission, Peer Review, and Document Tracking Systems						
	Criteria	**Priority**	**#1: Allen Press**	**#2: bePress**	**#3: Cadmus Journal Services**	**#4: ScholarOne**
COMPANY INFORMATION	Company Name		Allen Press	bePress (Berkely Electronic Press)	Cadmus Journal Services	ScholarOne
	Web Site URL		http://www.allenpress.com	http://www.bepress.com	http://www.cadmus.com	http://www.scholarone.com
	Product Name		AllenTrack	EdiKit	Rapid Review	Manuscript Central
	# of Yrs in Business		65	Founded in 1999	Parent company - over 100 years, CJS 9 years	about 4 (Carden Jennings Publishing, about 20 years)
	# of Clients Currently using software		X sites running (x clients)	over x peer-reviewed journals, dozens of electronic pre-print series, and x institutions and x journals in the pipeline	X publishers with x journals	x organizations/x publications
	# of Submissions processed		2500	160 submissions in 2001 (submissions doubled in the second half of the year)	30,000 manuscripts	125,000
	Years (month) services have been live		1 year	1.5 years	2.5 years	4 years

MetaData ?

Metadata ?

Metadata are essential to ensure that objects are locatable and that they are used appropriately. There are three classes.

- *Descriptive (or content) metadata* helps to find objects and know what they are about.
- *Administrative (or context) metadata* deals with who, what, where, why, and how associated with creation of the object it keeps track of things like things like file management and preservation.
- *Structural metadata* is of a technical kind pertaining to the relationships between or within objects. There is a general relationship between the cost of metadata creation and the benefit to the user.

Metadata Principles ?

Metadata Principle 1:

Good metadata should be appropriate to the materials in the collection, users of the collection, and intended, current and likely use of the digital object.

Metadata principle 2:

Good metadata supports interoperability.

Metadata principle 3.

Good metadata uses standard controlled vocabularies to reflect the what, where, when and who of the content.

Metadata principle 4.

Good metadata includes a clear statement on the conditions and terms of use for the digital object.

Metadata principle 5:

Good metadata records are objects themselves and therefore should have the qualities of good objects, including archivability, persistence, unique identification, etc. Good metadata should be authoritative and verifiable.

Metadata principle 6.

Good metadata supports the long-term management of objects in collections.

An alternative?
Social Bookmarking

D-Lib Magazine
April 2005
Volume 11 Number 4

ISSN 1082-9873

Social Bookmarking Tools (I)

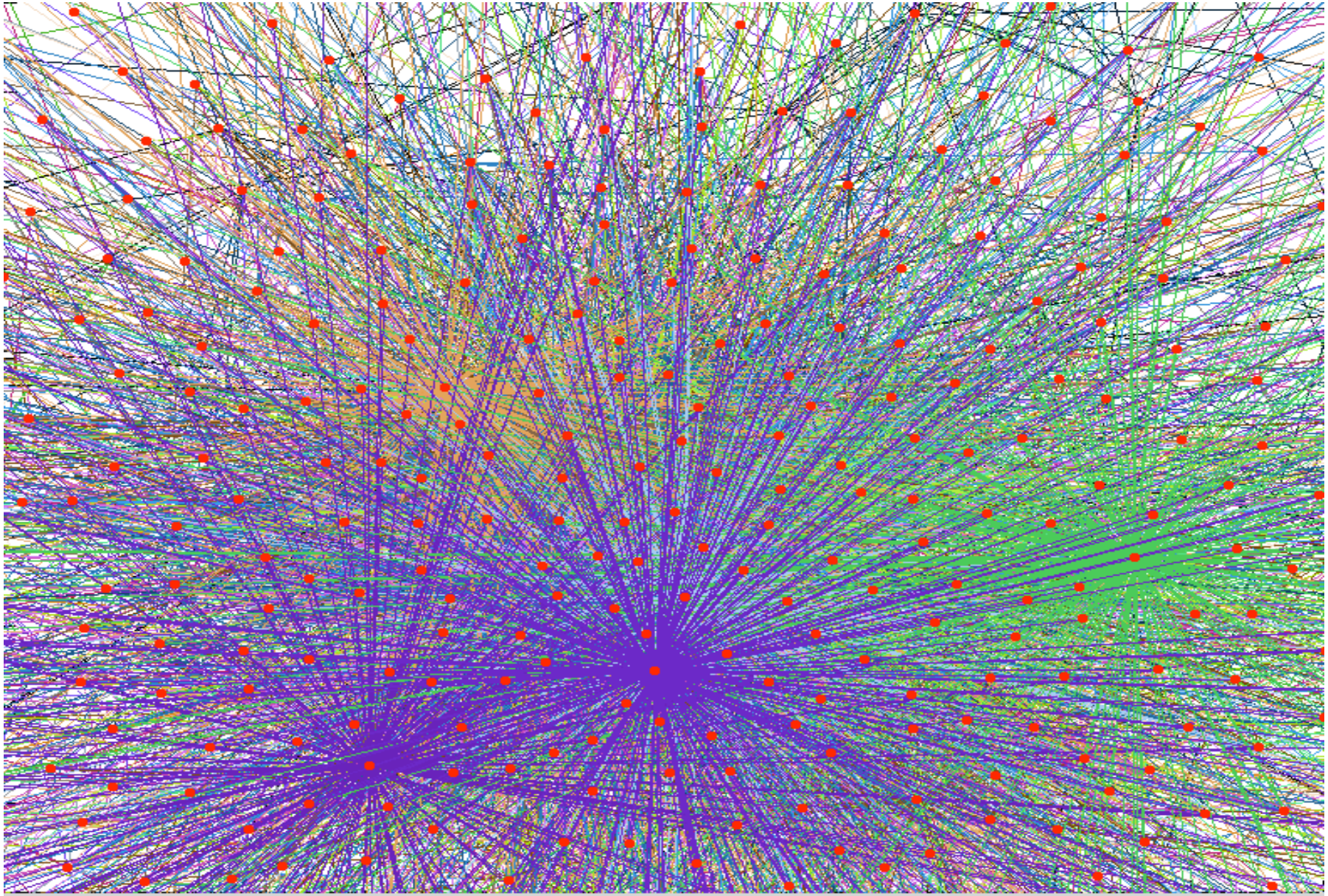
A General Review

Tony Hammond, Timo Hannay, Ben Lund, and Joanna Scott
Nature Publishing Group
{t.hammond, t.hannay, b.lund, j.scott}@nature.com

Social Bookmarking:

CiteULike	***http://www.citeulike.org/***
Connotea	***http://www.connotea.org/***
del.icio.us	***http://del.icio.us/doc/about/***
Flickr	***http://www.flickr.com/***
Frassle	***http://frassle.rura.org/***
Furl	***http://www.furl.net/***
Simpy	***http://www.simpy.com/simpy/Splash.do***
Spurl.net	***http://www.spurl.net/***
Unalog	***http://unalog.com/***

Networking



"Structure of the World Wide Web in Finland. Circles denote sites and lines denote connecting links."
Courtesy of Bernardo Hubernman (HP Labs, Palo Alto)
from B. Huberman The Laws of the Web, Cambridge, MIT Press, 2001

The Web

In 2000 we estimated the volume of information on the public Web at 20 to 50 terabytes; in 2003 we measured the volume of information on the Web at 167 terabytes - at least triple the amount of information. The surface web is about 167 terabytes as of Summer 2003; BrightPlanet estimates the deep web to be 400 to 450 times larger, thus between 66,800 and 91,850 terabytes.

The median size of HTM/HTML pages was 8 KB, but the mean was 605 KB. About 23% included images and 4% contained movies or animations, and about 20% contained Javascript applications.

There are about 2.9 million active weblogs ('blogs'), containing about 81 GB of information.

UCB SIMS. How much information? 2003 Executive Summary
http://www2.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm

The Semantic Web

A new form of Web content that is meaningful to computers will unleash a revolution of new possibilities

By Tim Berners-Lee, James Hendler and Ora Lassila

Overview / Semantic Web

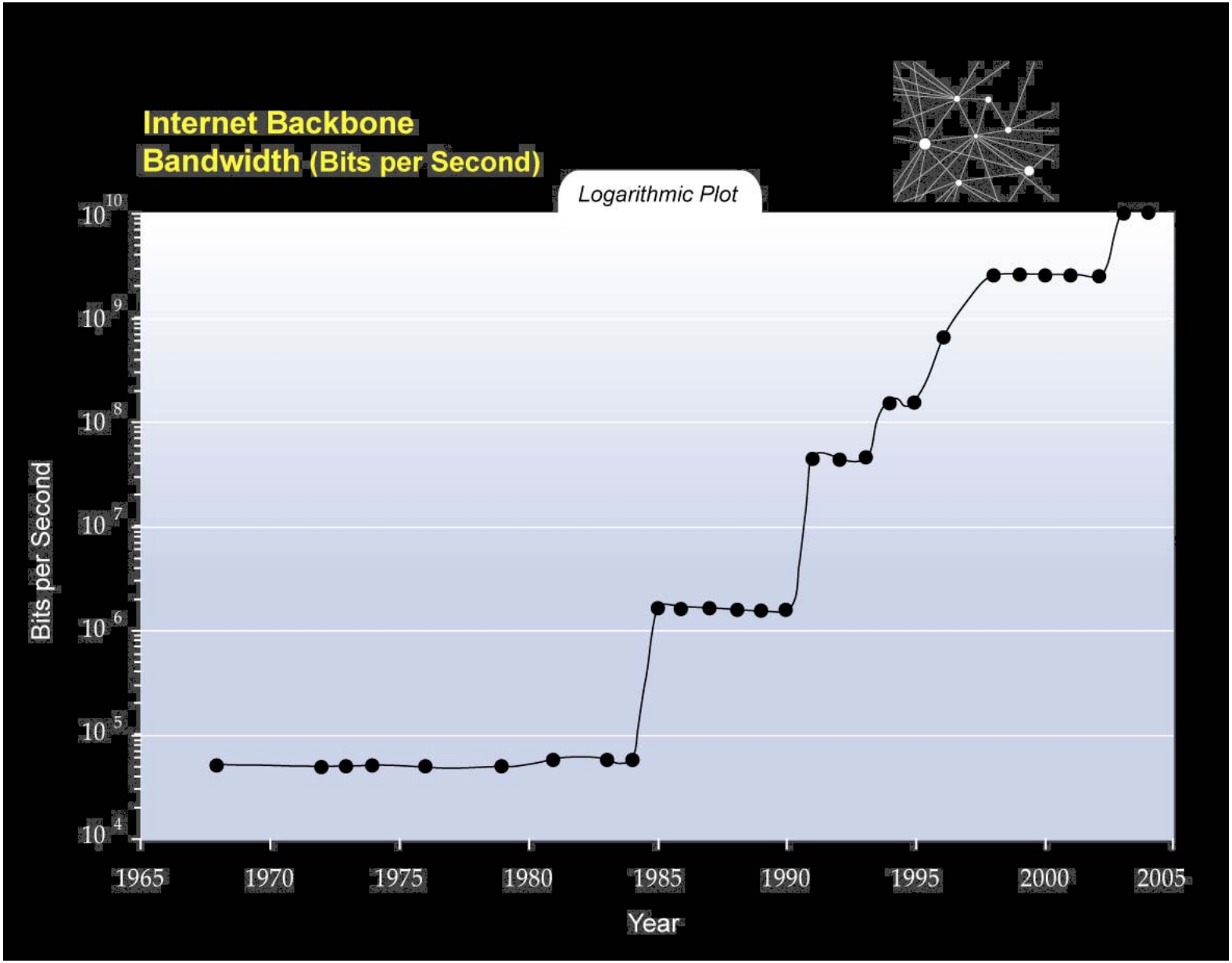
To date, the World Wide Web has developed most rapidly as a medium of documents for people rather than of information that can be manipulated automatically. By augmenting Web pages with data targeted at computers and by adding documents solely for computers, we will transform the Web into the Semantic Web.

Computers will find the meaning of semantic data by following hyperlinks to definitions of key terms and rules for reasoning about them logically. The resulting infrastructure will spur the development of automated Web services such as highly functional agents.

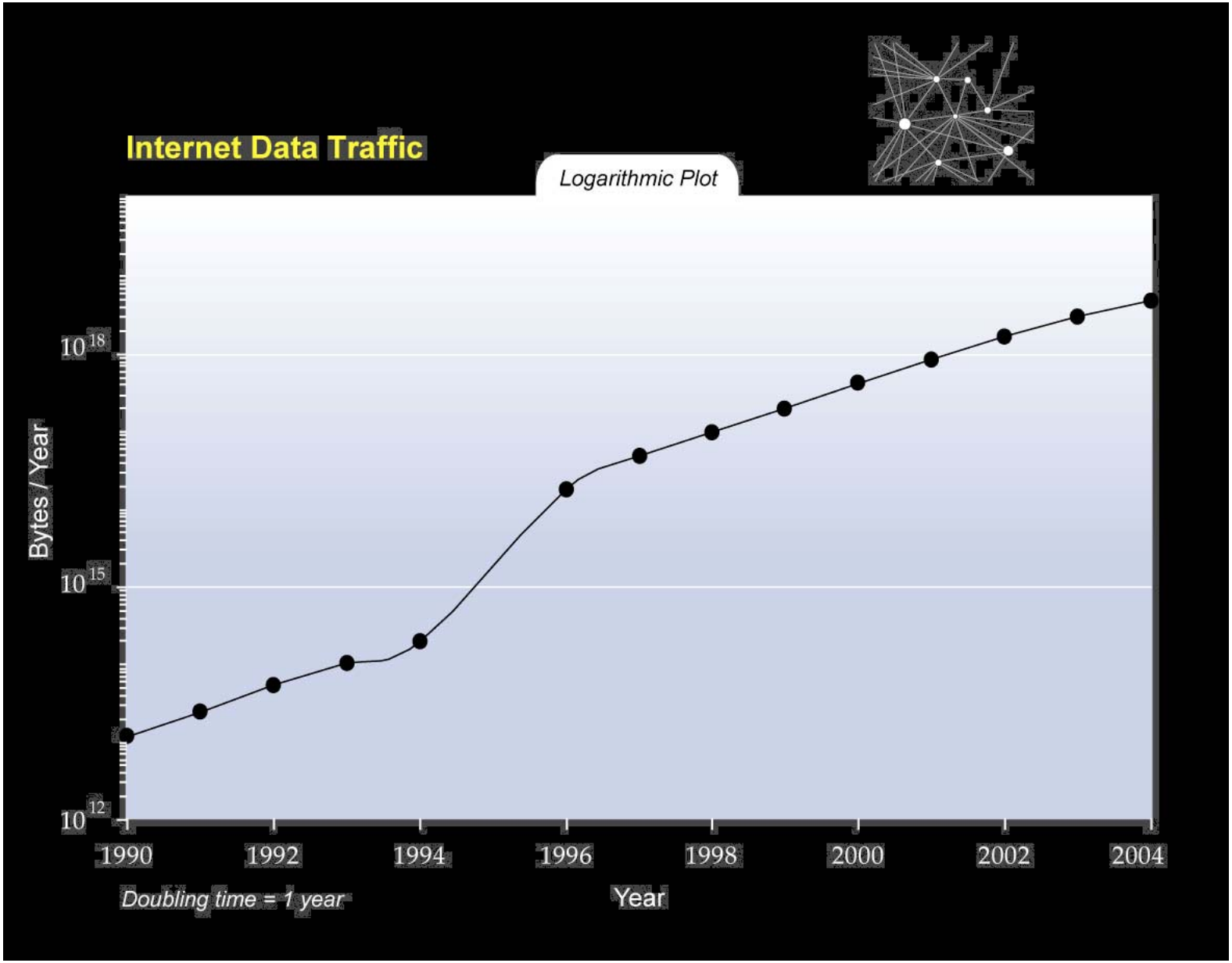
(article continues below) Ordinary users will compose Semantic Web pages and add new definitions and rules using off-the-shelf software that will assist with semantic markup.

-- *Scientific American* May 18, 2001

http://www.scientificamerican.com/article.cfm?articleID=00048144-10D2-1C7084A9809EC588EF21&pageNumber=1&catID=2



"Biotechnology and Nanotechnology: Two Overlapping Health Revolutions" Ray Kurzweil at The World Health Care Innovation and Technology Congress November 9, 2005 www.KurzweilAI.net/pps/WorldHealthCongress/



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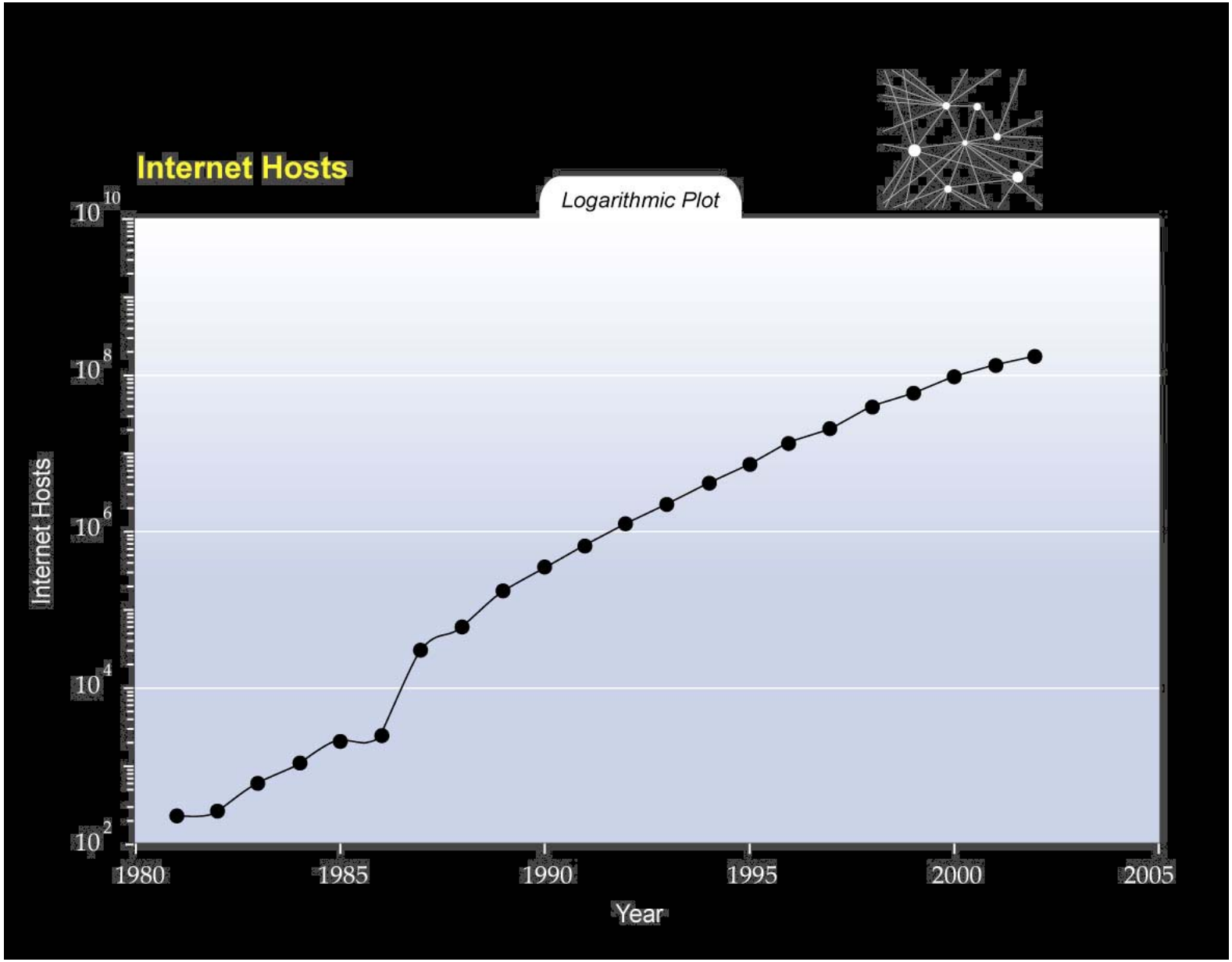

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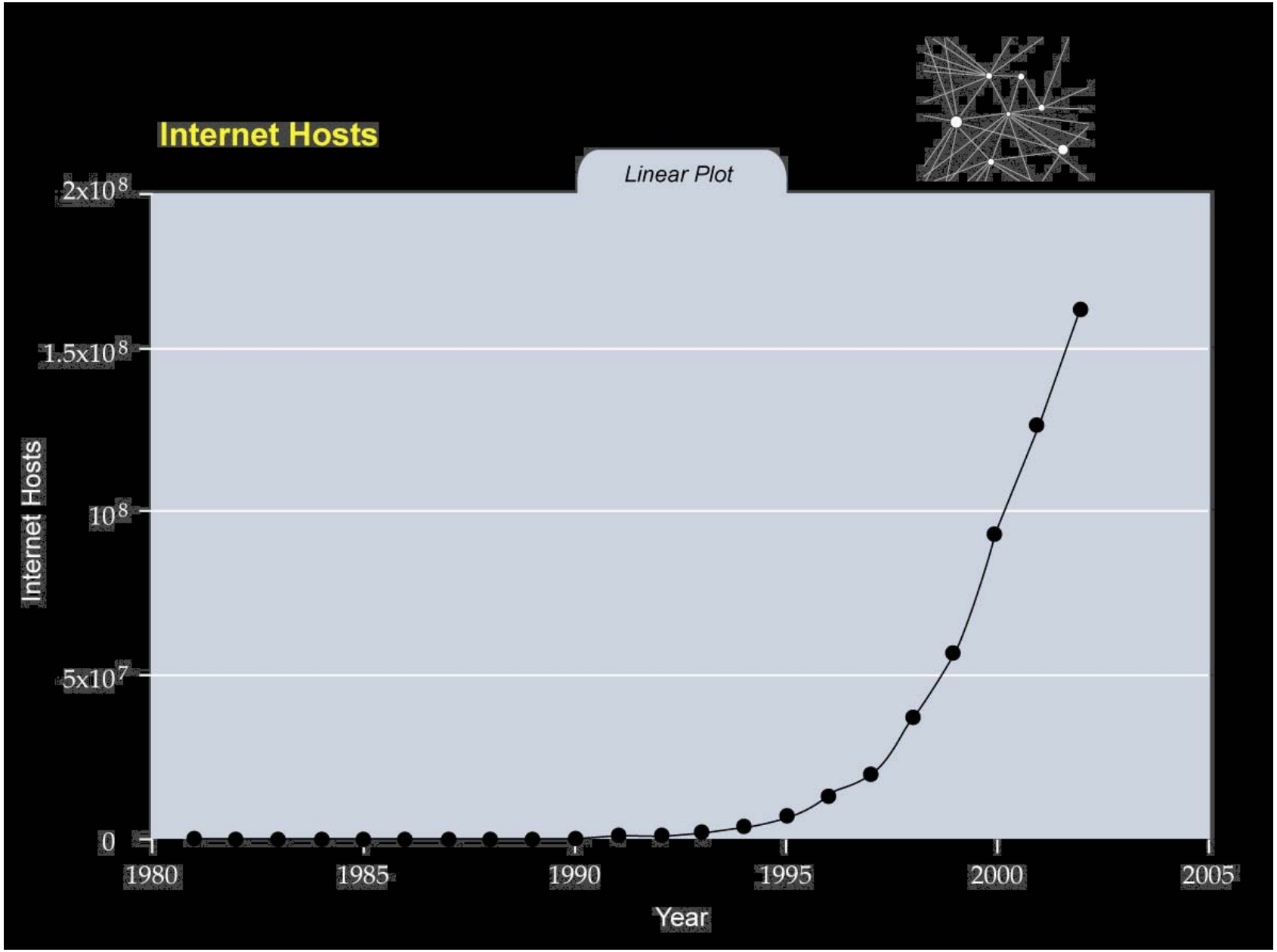

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Source: Nielsen / NetRatings via CyberAtlas

Digital Divide ???

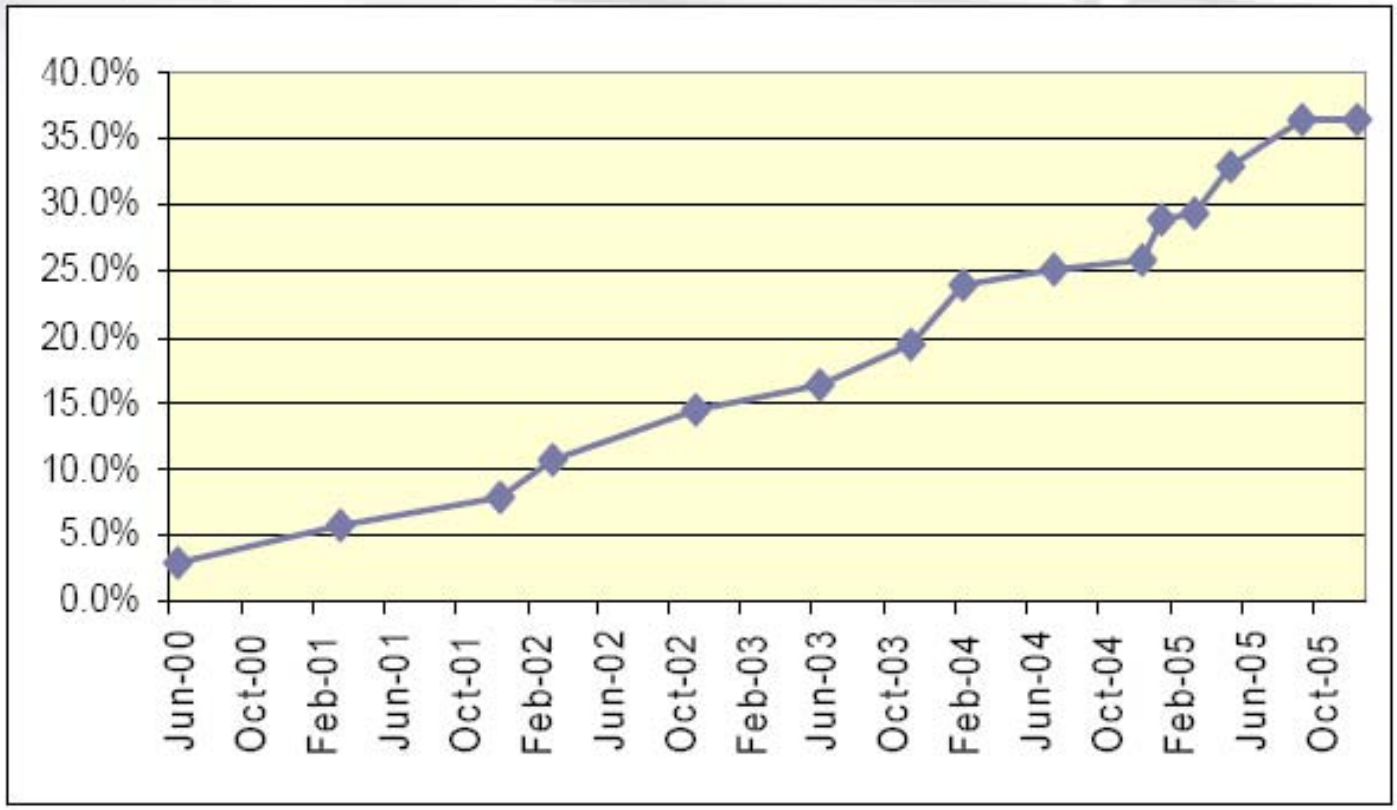
Around the world about 600 million people have access to the Internet, about 30% of them in North America.

Table 1.14: World Distribution of Internet Users (in millions)	
Africa	***6.31***
Asia Pacific	***187.24***
Europe	***190.91***
Middle East	***5.12***
Canada and USA	***182.67***
Latin America	***33.35***

UCB SIMS. How much information? 2003 Executive Summary
http://www2.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm

Broadband penetration in the U.S., 2000-2005

(% adults in the United States)



http://www.oecd.org/dataoecd/15/17/36133687.pdf

Estimated Digital HHs in Central Europe [HBO]

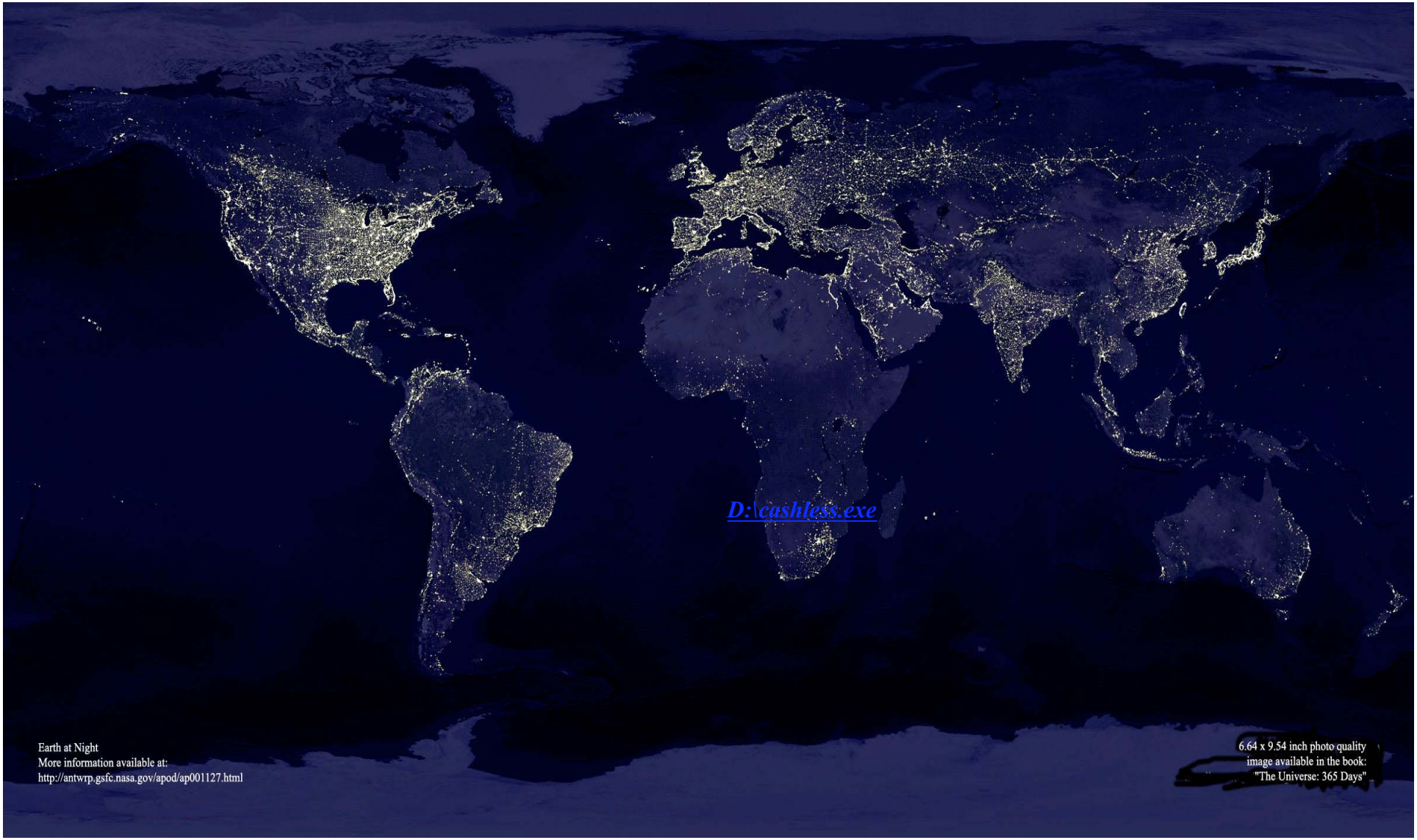
DIGITAL TV Households (000's)

Country	2004	2005	2010
Czech Rep.	90	97	707
Hungary	140	182	988
Poland	1,085	1,268	4,228
Romania	2	68	1,320
Russia	1,091	1,444	8,445
Total	2,408	3,059	15,688

Linda Jensen, CEO HBO Central Europe http://www.oecd.org/dataoecd/16/24/36174227.pdf
Source: Informa Telecoms & Media: New Media Markets

On-Line Culture?

“Accidental Heroes” ???



http://antwrp.gsfc.nasa.gov/apod/image/0011/earthlights_dmsp_big.jpg

"The United States produces about 40% of the world's new stored information, including 33% of the world's new printed information, 30% of the world's new film titles, 40% of the world's information stored on optical media, and about 50% of the information stored on magnetic media.

"Hard disks store most new information. Ninety-two percent of new information is stored on magnetic media, primarily hard disks. Film represents 7% of the total, paper 0.01%, and optical media 0.002%. "

UCB SIMS. How much information? 2003 Executive Summary
http://www2.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm

Email

About 31 billion emails are sent daily, on the Internet and elsewhere, ***a figure which is expected to double by 2006*** (source: International Data Corporation (IDC). The average email is about 59 kilobytes in size, thus the annual flow of emails worldwide is 667,585 terabytes.

Email ranks second behind the telephone as the largest information flow. **Email users include 35% of the total U.S. population** (source: eMarketer), and ***accounts for over 35% of time spent on the Internet*** (source: Forrester Research).

Sixty percent of workers with email access receive 10 or fewer messages on an average day, 23% receive more than 20, and 6% more than 50. 73% of workers spend an hour or less per day on their email.

Only two thirds of email traffic is personal, and spam (defined as unsolicited email) is about one-third of today?s email traffic, which is projected to increase to 50% four years from now (source: IDC). Therefore we estimate the upper bound of original content in emails as 440,606 terabytes (uncompressed), lower bound as 333,792 terabytes.

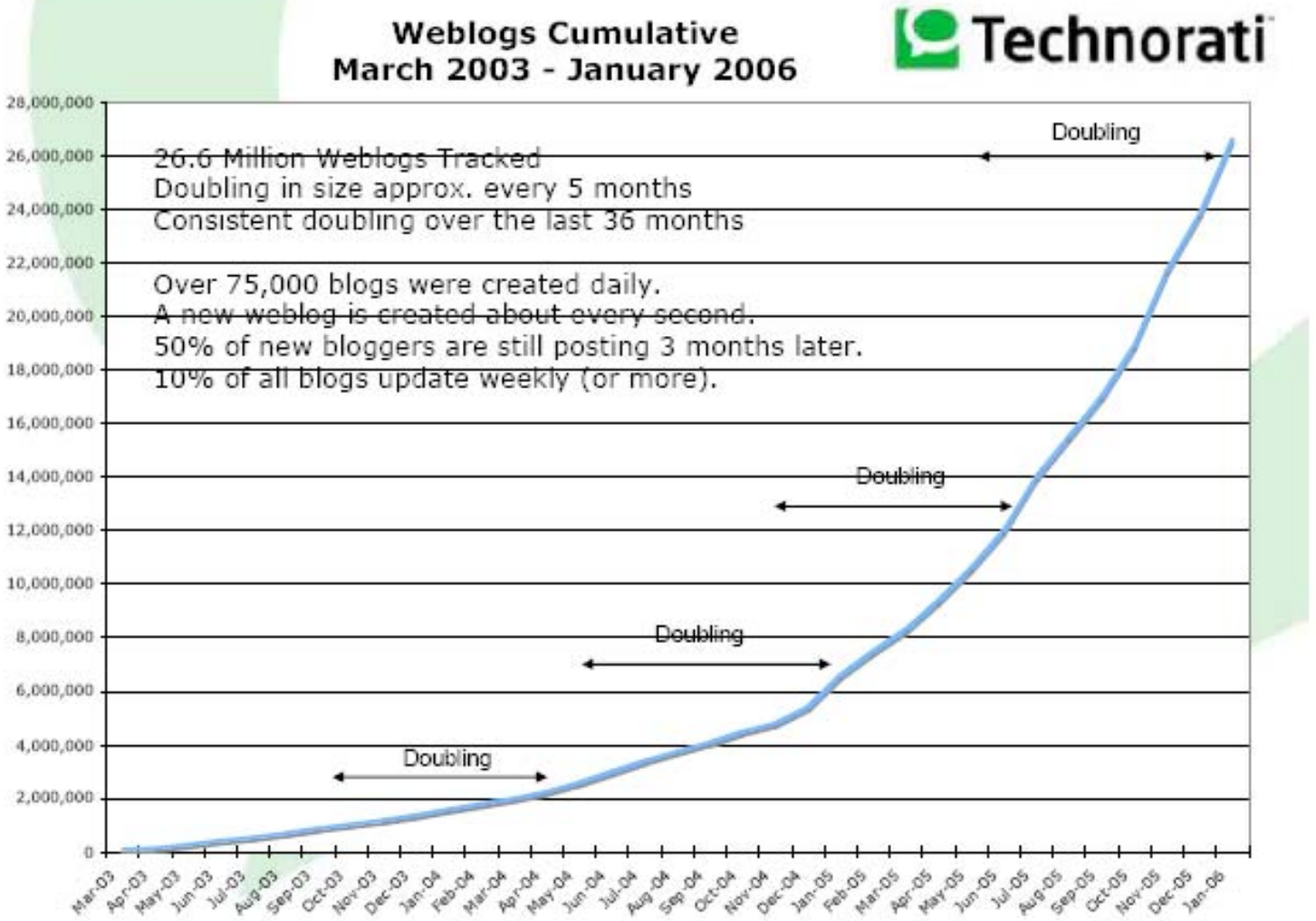
UCB SIMS. How much information? 2003 Executive Summary
http://www2.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm

Instant Messaging

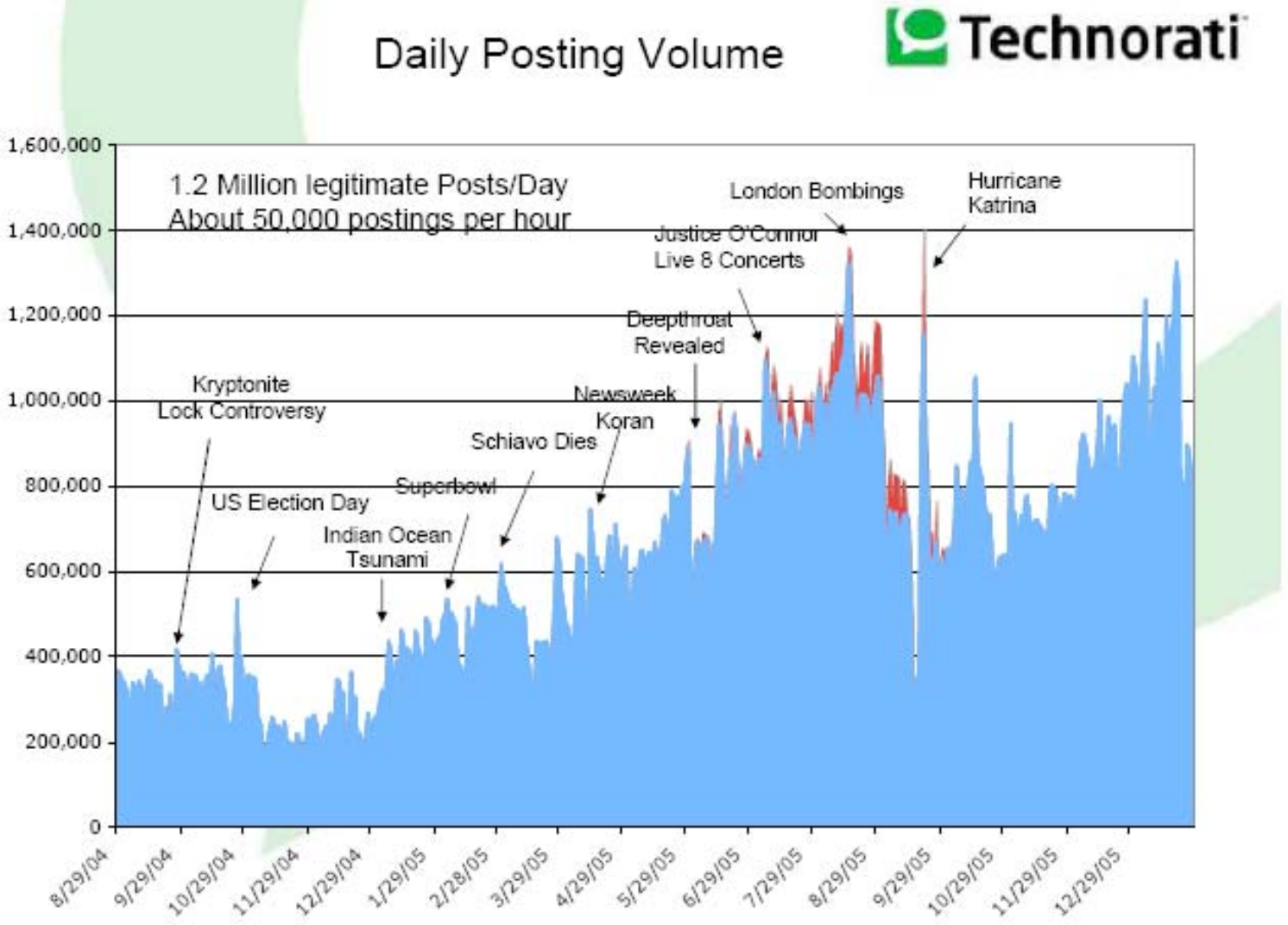
Nearly ***40% of U.S. Internet users at home logged onto one of the instant messaging (IM) networks*** at least once in May 2002, while 31% of U.S. business Internet users used IM (source: Nielsen/NetRatings).

UCB SIMS. How much information? 2003 Executive Summary
http://www2.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm

BLOGS

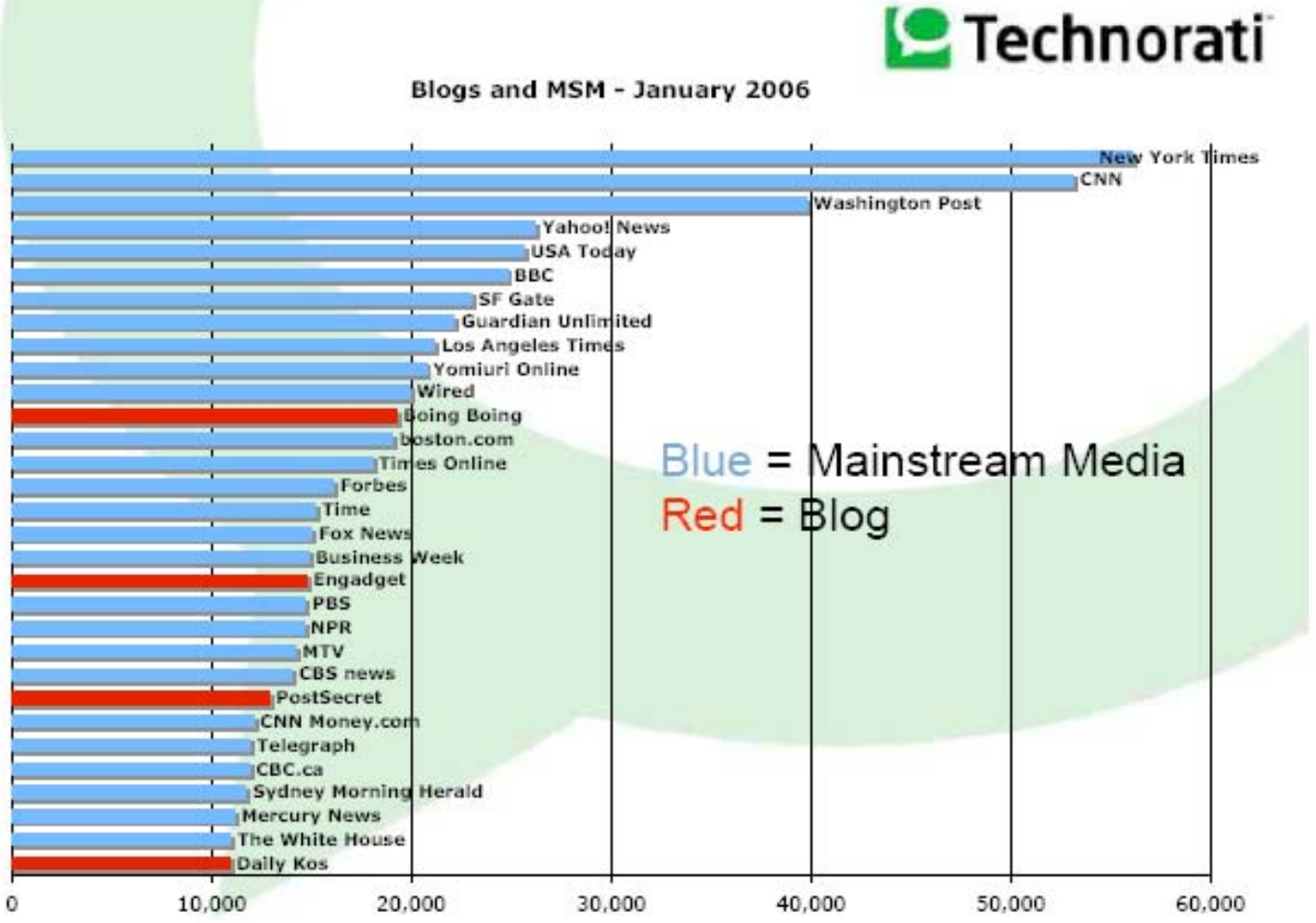


David Sifry, President, Technorati http://www.oecd.org/dataoecd/16/2/36174257.pdf



David Sifry, President, Technorati http://www.oecd.org/dataoecd/16/2/36174257.pdf

BLOGS and Main Stream Media



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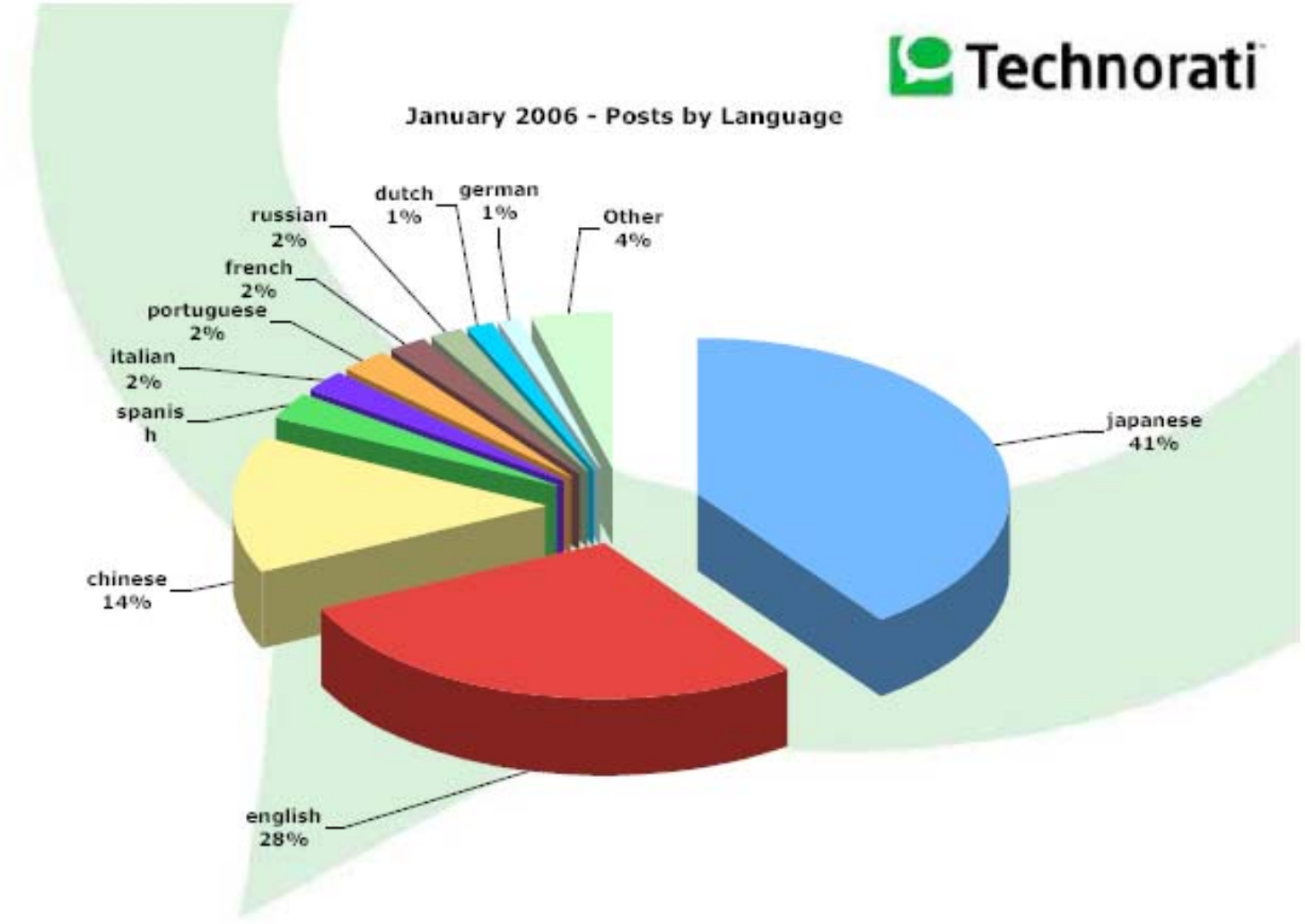

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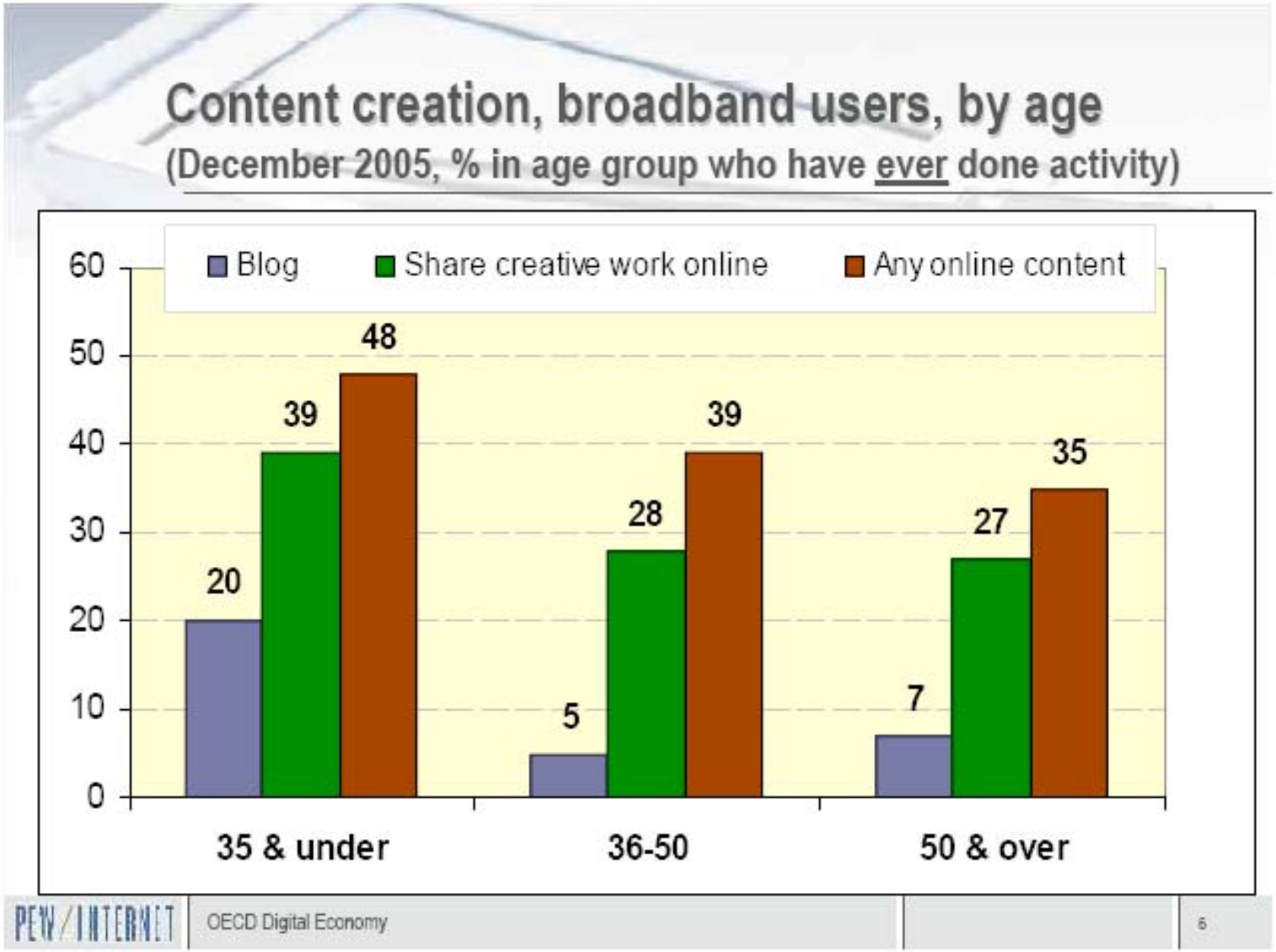
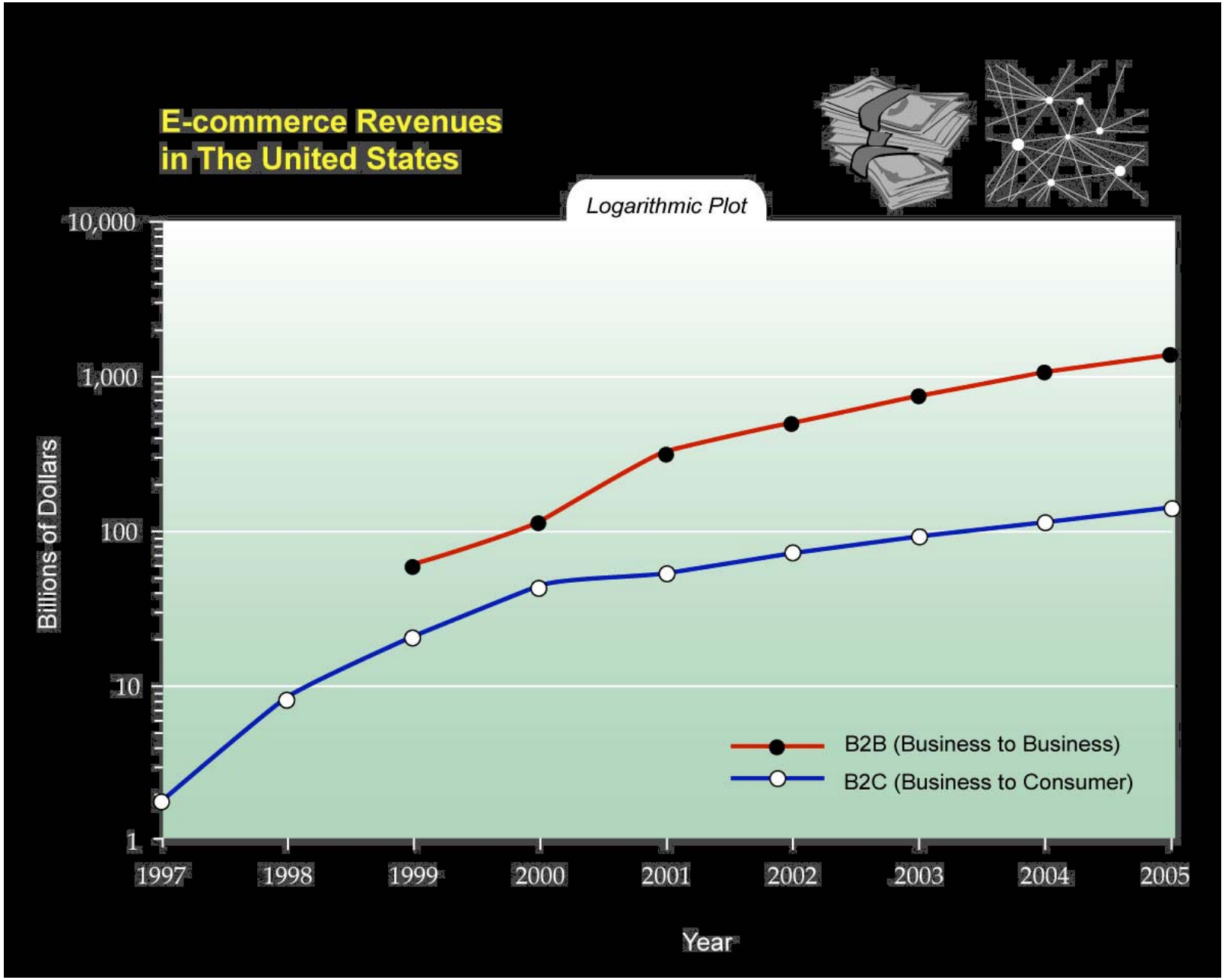


http://www.oecd.org/dataoecd/15/17/36133687.pdf

Three takeaways

- Internet increasingly embedded in:
  - People's news consumption
  - Entertainment habits
  - Creative lives
- Nearing inflection point of greater impact of internet on society
- An open internet is where an embedded internet thrives → network neutrality remains important for users

http://www.oecd.org/dataoecd/15/17/36133687.pdf



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WIRED MAGAZINE

The “Long Tail” ?

“Forget squeezing millions from a few megahits at the top of the charts. The future of entertainment is in the millions of niche markets at the shallow end of the bitstream.”

Chris Anderson *Wired* -- **October 2004**

- Wikipedia follows two key rules: NPOV (Neutral Point Of View) and free licensed content

Projects at a glance

The **Wikimedia Foundation** Inc. is a non-profit corporation aiming to develop and maintain open content, wiki-based projects and provide their full contents to the public free of charge.

Wikipedia: an encyclopedia containing more than 3 million articles in over 100 languages

Commons: a repository of images, sounds and videos containing more than 400,000 multimedia files

Wikinews: a news source containing original reporting by citizen journalists from many countries

Wikisource: a collection of published works in the public domain or released under free licenses

Wikiquote: a collection of quotations from notable people and creative works

Wikibooks: a collection of free educational textbooks and learning materials

Wiktionary: a dictionary cataloging meanings, synonyms, etymologies and translations

Wikispecies: a directory of species data on all other forms of life (animalia, plantae, fungi, bacteria, archaea, protista)

Frieda Brioschi, President, Wikipedia and Wikimedia Italia http://www.oecd.org/dataoecd/15/14/36133622.pdf

Scholarly Communications?

"A core inspiration is that the digital environment allows for (indeed, requires) systemic changes in scholarly communication procedures. This potential for fundamental change is related to **two properties of the digital environment that were unavailable in the paper world**:

> ***"First, the core functions of our scholarly communication system can be separated (at least theoretically) in the digital environment."***
>
> ***"Second, we will be able to record in a machine-readable form, then aggregate, and later data-mine the collection of events of this system."***
>
> '

H. Van de Sompel, "Technical solutions: Certification in a digital era: What functions do we take for granted in print?". http://www.nature.com/nature/peerreview/debate/op4.html

Core Functions of Scholarly Communication

- "***Registration***, which allows claims of precedence for a scholarly finding.
- "***Certification***, which establishes the validity of a registered scholarly claim.
- "***Awareness***, which allows participants in the scholarly system to remain aware of new claims and findings.
- "***Archiving***, which preserves the scholarly record over time.
- "***Rewarding***, which rewards participants for their performance in the communication system based on metrics derived from that system.

Roosendaal, H., Geurts, P in Cooperative Research Information Systems in Physics (Oldenburg, Germany, 1997).

"The ***limitations of a paper-based scholarly communication system*** have led to a ***vertical integration of all the functions*** into the traditional journal system. "

"The ***digital, networked environment*** allows for the functions of scholarly communication to be individually implemented by multiple parties in different ways, and then combined as alternative or companion services in what can effectively be regarded as a network-based value chain."

["*Disintermediation*" *???*]

H. Van de Sompel, *"**Technical solutions: Certification in a digital era: What functions do we take for granted in print?**". http://www.nature.com/nature/peerreview/debate/op4.html*

"In his pioneering sociological work, Emile Durkheim emphasized *"social facts,"* the *real, observable behaviors* that should underlie sociological thinking. Knowledge management has inherited that concern for social facts. *Rather than build from theory, it looks at what people actually do—the circumstances in which they share knowledge or do not share it; the ways they use, change, or ignore what they learn from others.* Those *social facts guide (or should guide) the development of knowledge management tools and techniques."*

L. Prusak, Where did knowledge management come from?, IBM Systems Journal Volume 40, Number 4, 2001["Knowledge Management"], http://www.research.ibm.com/journal/sj/404/prusak.html

"As access to information dramatically expands, so that people increasingly have access to almost all the information they might need at any time and in any place (and, surprisingly, at low or no cost),

the value of the cognitive skills still unreplicable by silicon becomes greater."

L. Prusak, Where did knowledge management come from?, IBM Systems Journal Volume 40, Number 4, 2001 [“Knowledge Management”], http://www.research.ibm.com/journal/sj/404/prusak.html